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CONCENTRATED SALINE IN THE TREATMENT OF CHOLERA (A PRELIMINARY REPORT)

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Rogers revolutionised the treatment of cholera by only adding an extra pinch of salt to the normal saline. Normal saline had been in use before the time of Rogers but it could not stand the test of time only because the effect was very transient, the patient becoming pulseless within a short time after the administration of saline due to rapid loss of fluid through the bowels. Although rapid and huge loss of fluid, even while hypertonic saline is being administered, is not uncommon, still the advantage of Roger's hypertonic saline over the normal saline has undoubtedly been confirmed on all hands. Whatever might be the rationale of the use of hypertonic saline, it occurs to some workers, though rarely, to advocate various strengths of saline, *e.g.*, 60 grains, 90 grains, 120 grains or even 240 grains of NaCl to the pint, with variously alleged results.

It is not only the quantity of the salt alone but the quantity of fluid also is variously advocated. In 1917-18 we had given 6 pints of hypertonic saline at a time in hundreds of cases with no untoward findings due to the saline itself. Now-a-days a quantity of 3 pints is rarely exceeded even when the specific gravity of the blood is 1072.

Banerjee (1941*a*) has observed that a great loss of chloride is found to occur in every case of cholera through vomiting and purging even after replacement of NaCl and fluids by an adequate quantity of hypertonic saline. It has further been observed that hypochloræmia in cholera even after administration of saline plays a great role in the production of azotæmia, uræmia and renal failure in cholera. Banerjee (1939) in his study on renal failure in cholera has observed further that not only in cholera but in other affections *viz.*, after burns, surgical operation, pyloric obstruction, toxæmia of pregnancy etc., in which loss of fluid is a prominent feature, two schools have developed—one advocating that hypochloræmia is of more importance than the loss of fluid while the other school advocates the reverse.

The present study is only to attempt to solve this problem adequately. Banerjee (1941*b*) in his studies on the role of interstitial fluid in renal failure of cholera, has observed that severe cases of cholera show a rise of 54 per cent in the concentration of blood, the average case showing 38 per cent and mild cases only 10 per cent, all these figures being from cases recovering after intravenous injection of saline. The rise in the concentration of blood even in average cases is undoubtedly of grave importance when the observation of Underhill and his coworkers (1923) is taken into consideration. They have observed that an animal or man cannot long survive a blood concentration of 40 per cent

over the normal value and when the concentration reaches 25 per cent over the normal value, conditions for the maintenance of life become precarious.

In cholera, no intake of fluid either as fluid or as food is possible through the alimentary tract. Thus the only route through which are absorbed all the fluids of the body, constituting about 70 per cent of the body weight under normal conditions, is thereby lost to the individual. Further, this very route acts as the channel of drainage to the whole of the fluid lost through evacuations in cholera. Fluid thus lost must be replaced and as the only normal route of intake of fluid is out of function, the idea of parenteral administration of fluid comes uppermost to one's mind.

A pertinent question may arise regarding the possibility of utilising the interstitial fluid which represents 3 times the total blood volume to replace the lost fluid in cholera, particularly because of the fact that this fluid in normal condition serves as an intermediary between the blood and the cells of the body and exchanging the fluid between the two components. With a view to study this problem the following observations have been made:—

1. On guineapig intraperitoneally—20 guineapigs destined to be sacrificed for the students' practical class in zoology,had been injected intraperitoneally each with 10 c.c. of a 20 per cent solution two hours before they are due to be killed. 12 of them died in one hour, 5 were found to be almost dying in 2 hours and the remaining 3 too ill to move. On opening the abdomen, the peritoneum was found to be containing a good quantity of fluid varying in amount from 10 to 45 c.c. and all the vessels intensely congested, not only of the peritoneum but also of all the abdominal viscera. Histologically, all these organs were found to be intensely congested both at the surface as well as internally.

2. In order to settle whether the fatal result after intraperitoneal injection of 20 per cent NaCl into guineapig was due to dehydration of the tissue by drawing in of the fluid from the blood into the peritoneum or the violent irritation of the peritoneum itself as a result of the high concentration of saline, a set of 4 guineapigs were injected with 10 c.c. of 20 per cent NaCl into the subcutaneous tissue at the back of the neck. The animals died in course of 4-8 hours. In only two animals the site of injection was found to be boggy and on incision the cellular tissue containing jelly-like fluid but in the other two no trace of increased accumulation of fluid was seen at the site excepting engorgement of the vessels but the animals died all the same. The cause of death is under further study.

3. In cholera patients the effect had been rather very encouraging. The first patient with 1065 specific gravity of blood received 25 c.c. of 20 per cent NaCl. He complained of intense headache lasting for a few minutes but curiously showed in half an hour a considerable lowering of specific gravity of blood which came down to 1059. The patient required no further intravenous injection. The other line of routine treatment was followed. The second patient received 50 c.c. of 20 per cent NaCl which had to be repeated twice with equally good results. In all the 5 cases with specific gravity varying from 1062-1065 introduction of 25-50 c.c. of 20 per cent NaCl, repeated when required, reduced the specific gravity effectively and thereby required no further injection of saline. A few more cases with œdema of the lung as contraindication of intravenous saline was treated with 20 per cent NaCl with very favourable results on the pulmonary œdema.

In fact, the uniform good result obtained by intravenous injection of such a small quantity of the fluid was rather very interesting. But the greatest drawback was the intense headache which had always been so severe and torturing to the patient that the house physician who gave the injections always hesitated to face the ordeal, even when a 10 per cent NaCl solution was administered.

4. The next set of experiments had been performed on cats, with a view to determine the nature of toxicity of concentrated NaCl solution. Unfortunately, the literature is too poor to show the pharmacological effect of concentrated saline. The cats (5 in number) had been anæsthetised first with ether and when sufficiently under, chloralose was introduced into the vein to keep the animal under proper anæsthesia. A cannula was introduced into the carotid artery which was either recorded on the kymograph or only the blood pressure reading was noted down. Respiration was also recorded either on the kymograph or only the rate noted down. The pulse rate was counted by feeling the heart beat. When the blood pressure became steady the solution consisting of 20 per cent NaCl in redistilled water (in one case a 10 per cent solution was used) was allowed to run slowly into the vein at a rate of 1 c.c. per minute until the death of the animal took place.

The tracing on the kymograph shows that the animal weighing 2·2 Kg. died with only 18 c.c. of 20 per cent solution. The death is too sudden, the respiration failing first and then the heart. (Fig. 1). The sudden death is uniformly observed in all the animals and that without any previous warning. The total amount of fluid required to kill the animals varied from 18 to 35 c.c. in a cat of about 2 Kg. It took about 68 c.c. with a 10 per cent solution. The animal invariably passed a good quantity of urine shortly after the saline injection was started and the bladder is found to be overdistended postmortem as show in Fig. 2. The postmortem examination curiously shows an increase of interstitial fluid in all the abdominal organs, the intestines appearing more white with swollen appearance externally. Liver, spleen, and more particularly the pancreas appear bulky. The brain, on the other hand, shows no evidence of any œdematous condition externally.

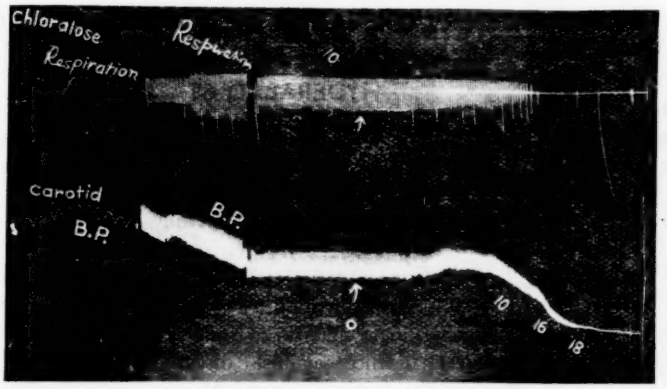

FIG. 1—Showing the kymographic tracings in a cat injected with 20 per cent NaCl solution. Intravenous injection was started at the arrow mark on the B. P. tracing and the figures at the bottom indicate the amount of saline in c.c. introduced. The B. P. shows a gradual rise until 10 c.c. had been introduced when the respiration failed. The heart actually stopped when 18 c.c. had gone in.

FIG. 2—Postmortem finding of a cat after injection of 20 per cent NaCl solution. No fluid in the peritoneal cavity but all the abdominal viscera had been more bulky and appearing œdematous. The line points to the urinary bladder distended to the limit. The animal passed about 20 c.c. of urine during the period of the intravenous injection.

The animals so far used are too small in number to allow any conclusion to be drawn, but undoubtedly afford sufficient data for further research. Further experiments are in progress with different strengths of NaCl solution either alone or with other chemicals *e.g.*, glucose, etc. also with or without previous administration of atropine, adrenalin, etc.

CONCLUSION

The material so far obtained from administration of concentrated sodium chloride solution in 5 cholera patients with high specific gravity of blood and collapse, and a few more with pulmonary œdema supplies very encouraging result. A quantity of 50 c.c. of a 20 per cent NaCl solution intravenously, is quite sufficient to effectively lower the specific gravity of blood in a short time and serves the same purpose as that of 3 pints of hypertonic saline administered intravenously. The idea of this form of treatment has been obtained from the writer's observation that hypochloræmia is a prominent finding in cholera and that persists even after intravenous administration of saline suggesting that in cholera there is more loss of salts than of fluids.

The effect after administration of concentrated saline appears to be due to drawing in of the interstitial fluid into the circulation which exists in normal condi-

tion in a proportion of 3 to 1, *i.e.*, interstitial fluid constituting 15 per cent of the total body weight while the blood fluid 5 per cent of the body weight. The most severe case of cholera shows a rise of 54 per cent in the concentration of blood. Assuming that even when the half of the total blood volume is lost, which is rather quite unusual, and that along with a considerable loss of interstitial fluid, it may be further assumed that a great amount of reserve in the interstitial fluid still exists which can be drawn into the blood in order to lower the specific gravity. The only drawback in the use of concentrated saline is the intense headache appearing immediately with the injection and lasting for sometime. A few experiments have been performed on animals, which consist of 20 guineapigs injected intraperitoneally, 4 guineapigs subcutaneously, 5 cats intravenously with 20 per cent and 10 per cent NaCl solution to determine the lethal dose and other pharmacological effects of concentrated saline. Further animal experiments are in progress and those with concentrated saline with or without glucose and other chemicals and also administration of atropine, pituitrin, adrenalin, etc. These experiments are being done with a view to gain more knowledge before this method of treatment could be efficiently taken in hand during the next epidemic.

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REFERENCES

BANERJEE, D. N. (1939)—*J. I. M. A.*, 9:55.

Idem (1941 *a*)—*Indian M. Gaz.*, 76:345.

Idem (1941 *b*)—*Antiseptic*, 38:523.

UNDERHILL, F. P., CARRINGTON, G. L., HAPSINARD, R. AND PACK, G. T. (1923)—*Arch. Int. Med.*, 32:31.

OBSERVATIONS ON DIETARY HABITS AND NUTRITIONAL CONDITIONS IN HYDERABAD STATE

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During recent years marked progress has been made in the subject of nutrition. Its study has made it clear that an adequate nutritional state is also one of man's strongest defence against disease. Besides, many diseases like beriberi, xerophthalmia, night blindness, pellagra, angular stomatitis, whose causes were hitherto unknown or only suspected, were found to be due to dietetic errors. Thus today Public Health authorities are no less concerned with nutrition, than with pure water supply or control of infectious diseases. In view of the above fact the Public Health Department of H.E.H. the Nizam's Dominions undertook to do diet surveys and to ascertain the dietary habits of the people and to find out the existing deficiency diseases in this State.

Within less than two years we surveyed 58 villages and persons belonging to differet families with various income groups and about 10,000 school children. From the surveys done so far we can conclude that the villagers consumed the same type of food in the districts of Telangana. The only variation found, is the type of cereals taken. At one place the chief cereal may be rice and at other places is may be *jawar* or *ragi*. As for the other articles of diet, *e.g.*, pulses, vegetables and fats, the food is stereotyped and monotonous and below the prescribed standard. The "protective foods" like milk, butter, eggs and meat are included in negligible quantities. However, we find that on an average the calorie intake in income groups of 10 to 20 rupees a month reach the prescribed standard but more than 80 per cent of such calorie intake is derived from cereals like rice, jawar or ragi and the rest of the calories come from important protective foods.

The above statement can be verified by the tabular representation of ounces per consumption unit per day of various foodstuffs by persons of different income groups (*vide* Statement I).

STATEMENT I—OUNCES PER CONSUMPTION UNIT PER DAY

Foodstuffs	*Group I Rs. 1 to 5*	*Group II Rs. 6 to 10*	*Group III Rs. 11 to 20*	*Group IV Rs. 21 to 30*	*Group V Rs. 31 to 50*	*Group VI Above Rs. 50*
Rice home-pounded ..	4·1	5·1	5·6	8·7	6·4	9·1
Rice milled	—	0·1	0·1	1·0	1·6	2·4
Wheat	—	—	—	0·1	0·2	—
Jawar	11·0	12·6	8·5	12·4	9·1	7·9
Other millets	7·2	9·0	9·8	4·0	4·5	5·2
Pulses	0·5	0·9	1·3	2·5	2·3	2·1
Leafy vegetables ..	0·1	0·2	0·1	0·2	0·1	0·2
Non-leafy vegetables ..	0·1	0·1	0·2	0·4	0·4	0·1
Ghee	—	—	0·1	0·2	0·3	0·3
Vegetables oils	0·1	0·1	0·2	0·3	0·2	0·3
Milk and milk products ..	0·7	1·5	4·4	3·7	6·6	4·2
Meat, fish and egg ..	0·4	0·3	0·4	0·2	—	0·3
Sugar	—	—	—	—	—	—
Condiment	1·4	1·3	1·9	2·3	1·5	2·7
Total calories	2,896	2,972	3,082	2,933	2,874	3,094
Calories from cereals only	2,230	2,690	2,400	2,620	2,180	2,460

While doing the surveys, the families were divided into separate groups according to their actual income ranging per family from Rs. 5/- a month to Rs. 50/- a month and above. The procedure adopted in carrying out the survey was of weighing every food stuff, morning and evening before it was cooked. An ordinary balance is used and weights were taken in ounces and pounds.

From the above statement we see that though milled rice is consumed by higher income groups, consumption of home pounded rice is not given off, and that both richer and poorer classes consume home pounded rice. With the fall of income, rice is replaced by millets like jawar and ragi. In some places Italian millet (*kangni*) is consumed both by the poor and higher income groups. Thus we see that in villages rice as well as other millets are consumed. The villagers do not depend upon rice only, as in rice eating countries of Madras or Bengal, as shown hereafter.

MEAN INTAKE OF VARIOUS FOODSTUFFS

	Madras	*Bengal*	*Hyderabad*
Rice home pounded ..	—	—	6·7
Rice milled	18	25	0·9
Jawar	—	—	10·2
Other millets ..	—	—	6·6

Luckily amongst the villagers, the practice of eating milled or polished rice has not come in vogue; and in a way it is a blessing in disguise, because parboiling of rice is not done in this country and if unparboiled rice is milled most of its vitamins and minerals are lost in the bran.

But from the diet survey of Hyderabad City amongst the persons of the same income groups, we find that the fashion is of taking more milled rice and very little of millets. Home pounded rice is not used in the City at all and not only that but it is almost impossible to procure it.

The statement below shows it clearly.

Family income per month.	*Rs. 12*	*Rs. 17*	*Rs. 18*	*Rs. 22*
Home pounded rice	nil	nil	nil	nil
Milled rice	13	25·5	19	15
Millets	—	1·3	4·8	4

Thus since home pounded rice and other millets with it are taken there is no deficiency in the intake of vitamin B_1 from cereals.

In certain parts of Medak district (taluqa Siddipet) it was found that the chief and only cereal used was Indian maize and incidentally cases of pellagra in their most characteristic form were seen. This was found mostly in poor classes—agriculturists and outdoor workers. Most of the cases were seen in women. The incidence of disease was seasonal, increasing with the season of maize crop. The disease was surprisingly absent in some adjacent villages and also in the same village amongst certain families who substituted maize with other cereals. Some early cases of pellagra with their characteristic skin lesions on the exposed surfaces of the body who had nothing of this a day or two before, stated that only a few hours exposure under the sun had precipitated the attacks. The skin at these sites was

found to be rough and scaly and a well-formed demarcation line existed between this and the healthier skin. They complained of burning sensation at these sites. Thus it seems that there may be many more who do not actually show any signs of the disease but are just about the level of lowered resistance so that even a few hours exposure would bring on the disease. Symptoms of diarrhœas and dementia—characteristic of the disease in the latter stages—were not found to be present in any case.

In the same district we detected some old cases of lathyrism. It is said that some 20 years ago there was severe famine which forced the villagers to consume the-then-only available foodstuff *kesari dal* (*Lac ki dal*). Probably consuming of this *dal* with seeds of the contaminating weeds *Vicia Sativa* had precipitated the symptoms of lathyrism. Villagers thus came to know by experience that this *dal* was the cause of the disease and hence they gave it up and took to Italian millet (*kangni* or *korralu*) and since then no fresh cases have occurred.

Vegetables—It is surprising to find that the intake of vegetables, leafy and non-leafy, is extremely low and does not come to the standard even with the increase of income. This can be seen from the Statement I. Even in other provinces like Madras and Bengal the intake of leafy vegetables is extremely low. Naturally the intake of vitamins A and C falls much below the standard and hence xerosis and Bitot's spots are the common widespread signs which we come across during the examination of school children.

Pulses—These are consumed by all the groups but in varying quantities according to the level of income. In poor income groups the quantity consumed is less but amongst higher income groups it reaches the standard of 3 ozs. per head per day. These pulses form the chief sources of protein in most of the diet of the villagers, as meat, fish, egg or milk is taken very occasionally.

Fats and oils—Ghee is consumed by the higher income groups in very small quantities with variable amount of vegetable oils. Lower income groups use only vegetable oils. In all the groups from Statement I it will be seen that the quantity of fats consumed is extremely low—instead of 3 ozs. per head per day, only 0·1 to 0·2 ozs. are taken. We find the same thing in other provinces also. In Madras and Bengal the unit of consumption is about 0·5 and 0·3 ozs. respectively. In Hyderabad it is about 0·1 to 0·2 ozs.

Milk and milk products—As a matter of fact the produce of milk in villages of Telangana so far surveyed is very little and cannot cope up with the increasing demand. On the other hand people belonging to the lower classes, *i.e.*, first three groups, were not seen to consume milk, ghee or butter. They either sold the milk as it is, if they were near big towns, or converted it into ghee and sent it to markets for being sold. The little money which they get out of this transaction was utilised for the purchase of their daily necessities of life. Butter milk is, however, used by them in lesser or greater quantities as available.

Meat, fish and eggs—These are included in the diet in negligible quantities. The poor groups, however, consume beef and flesh from dead animals as many of them belong to the depressed class.

Thus we see that there is a general deficiency of fats, minerals and vitamins A and C in all the groups due to negligible inclusion of protective foods *e.g.*, green leafy vegetables, milk, fish and eggs which are great sources of important food factors.

As a rule wherever rice forms the staple cereal the intake of calcium is lower than the standard. Millets like ragi and jawar contain a fair amount of calcium and those who consume these just reach the prescribed standard 0·68 grms. per head per day.

Extremely low consumption of protective foods is bound up with the general economic problem and also with the agricultural policy of a country.

The investigation of the incidence of deficiency diseases does not show the corelation between it and the income. In lower income groups it may be less though they consume poorer diet or it may be more in higher income groups in spite of better diet. This variation, at present, is not explainable. Perhaps, we have not investigated enough number of families.

INCIDENCE OF DEFICIENCY DISEASES AMONGST INVESTIGATED FAMILIES

	Group I	*Group II*	*Group III*	*Group IV*	*Group V*	*Group VI*
Xerosis ..	3·7	4·0	4·6	1·6	5·6	3·8
Bitot's spot ..	3·0	2·5	1·0	1·6	2·2	2·8
Angular stomatitis	1·3	3·8	2·6	—	--	2·3
Glossitis ..	9·1	4·0	2·6	0·5	2·0	3·9

From our investigations it seems that there are four reasons for the villagers not to consume a liberal amount of protective foods. Firstly, these articles are expensive

and secondly, they are much less *filling* than the foods made up mainly of cereals. Thirdly, their sale secures them ready money whenever they need it and fourthly, a general prejudice against these articles of diet as they are considered to be heat producing.

There exists a great economic factor which is closely interrelated with the problem of nutrition. Intake of an ill-balanced diet over long periods naturally produces deficiency diseases. However, on mere physical examination no evidence of any deficiency disease might show itself, even though they appear to be underdeveloped and malnourished. Slight exertion or an attack of exhausting disease in the meantime, might bring on the symptoms and signs characteristic of deficiency diseases. Human beings, however, can adapt themselves at a lower level of vitality and they scarcely realise that they are underfed. The indirect result of dietary deficiencies can be observed in the shape of retarded growth, loss of nervous energy, restlessness, loss of memory and most important diminished out put of work.

Deficiencies in diet and diseases of nutritional origin can be observed, not only among rural populations and dwellers in country districts, not only in poor and primitive countries but also in the rich nations with highly developed civilisation.

The question of nutrition is not only to be handled by the Public Health Department but it is also to be dealt with by other departments such as Agricultural, Educational and the Co-operative. The agricultural policy and administration must be based upon the dietary requirements of the people; and they should control the produce and distribution in the interest of the consumer.

Besides the above mentioned facts, our nutrition surveys have brought into evidence another important chronic disease in our State and that is fluorine intoxication. Veterinary department of this State drew our attention to the progressive changes in bones and joints of cattle with yellowish discolouration of teeth at the roots. Remembering this fact, during survey work of Southern and South-eastern portions of the Dominion, bordering Kurnool district, search was made for evidence of mottling or chalky white enamel of teeth. Cases of mottled enamel, chalky spots and coloured chalky bands across the teeth were detected amongst children. This led us to suspect chronic fluorine intoxication. To confirm the clinical findings, analysis of drinking waters from the wells and springs in those parts were made to ascertain the fluorine detection and amount of fluoride contents in them. Majority of the drinking water supplies from wells showed a fluoride content on an average 1 to 2 parts per million and in about half a dozen cases, bony involvement and joint affections in elderly people were noticed and we inferred clinically that those were advanced cases of fluorine intoxication.

The most important point we found out was that the higher incidence and severity of fluorine intoxition had a definite relation to the economic and nutritional status.

In the families we investigated, the intake of vitamin C was very very low and the same opinion has been expressed by Pandit Raghavachari and Krishnamurthi in the *Indian Journal of Medical Research* of October 1940. They say "A pronounced deficiency of the vitamin C factor in the diet was specially associated with a severe incidence of the disease." Thus, though fluorine intoxication is due to water intake, its incidence and severity has much to do with dietary and nutrition.

We are investigating the matter further.

Lately, the question of nutrition and health has been engaging great attention in India and His Excellency Lord Linlithgow has correctly remarked, "What indeed is the use of spending public funds on objects such as education, welfare schemes and the like, if the people have not the health and vigour of mind and body to take full advantage of them and to enjoy?" Indeed this question has been taken up with keen interest by the Public Health authorities in many provinces and even by some of the social workers. It deserves every encouragement from the medical profession and specially general medical practitioners.

ACKNOWLEDGMENT

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QUININE PROBLEM IN INDIA

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Osler's oft quoted dictum that malaria is probably the greatest single destroyer of the human race is by no means exaggerated. In India alone, it has been estimated that malaria is directly responsible for over one million deaths per annum. Apart, however, from actual mortality a vast amount of ill-health is caused by malaria, whilst those debilitated by attacks of this disease become easy victims to other infections. This incapacity to individuals adversely affects the well-being of the nation as a whole. The great economic loss thus caused and its repercussions have a most serious effect on the country. Malaria constitutes today one of the most urgent problems of Social Medicine. Preventive measures, no doubt, are the best to combat the disease but in a vast and poor country like India it is not possible to undertake elaborate and well-organised measures; these entail many factors, *e.g.*, financial liability, organisation, education of the public regarding health problems, etc. It is obvious, therefore, that curative treatment should still remain the only or at least the only practical solution for the present for the poverty-stricken people of India.

About 30 per cent of the population in India suffer annually from malaria but only a fraction gets either complete or partial treatment. The problem of drug treatment for such a population has not been solved as will be evident from the figures given below showing the consumption of quinine *per capita* (Chopra, 1931, Drugs Enquiry Report).

India	3·5 grains.
Bengal:	
Burdwan	1·07 grains.
Presidency Division	1·31 grains.
Rajshahi	1·07 grains.
Dacca	1·5 grains.
Chittagong	2·7 grains.

To obtain even a minimum of 45 grains per patient, it will require a 15 grain *per capita* consumption. This shows the deplorable inadequacy of quinine supply in India and specially in regions where malaria is most prevalent.

On a conservative estimation, India requires some 1,250,000 lbs. of quinine, but the actual consumption is 200,000 lbs. of which 70,000 lbs. only are produced in this country. Until the Japanese occupation, Java had the virtual world monopoly and India depended on this island for most of her quinine requirements. The deprivation of this chief source of supply has most adversely affected the "quinine shortage" in India. The synthetic anti-malarial drugs which to a certain extent helped in relieving the demands of quinine are no longer available. Further, the supply of quinine for the civil population has perforce become limited owing to the inevitable diversion for military requirements both in India and abroad. Owing to the present unsettled conditions, again, there has been a considerable migration of urban population to rural areas with consequent increase in the incidence of malaria.

The problem which confronts us at the moment is what can be done to avert a greater crisis. Any solution to prevent further deterioration should not only take into account the present situation but should also be considered with an eye to the future. So that even after the war India may be self-supporting so far as her quinine supply is concerned. To this end the following measures may be considered:—

(1) Restricting the use of quinine to cases of clinical attacks of malaria only. (2) Using the minimum effective dose. (3) Replacing quinine by totaquina. (4) Recovery of quinine from urine of patients treated with the drug. (5) Production of more quinine or totaquina by extending cinchona plantation. (6) Investigating on a scientific line the many indigenous drugs of antimalarial value. (7) Finding out some synthetic products with a view to supplement the natural alkaloids or synthesis of quinine itself.

The different aspects of the problem may now be considered:—

1. *Restricting the use of quinine to cases of clinical attacks of malaria only*—As regards prevention of infection, there is no evidence that its use has any effect. But the term "prophylaxis" in relation to malaria is employed to mean the prevention of clinical symptoms following infection. The prophylactic treat-

ment undoubtedly diminishes the morbidity, but it cannot suppress the parasites, in all the carriers. Further, to be effective, it must be applied (0·4 gram daily) to disciplined communities under strict supervision and during the whole of the malaria transmission season and even for a few weeks longer. Perhaps more quinine is used up in prophylaxis than in the actual treatment of the disease.

Again special stress should be laid upon the desirability of promoting the immunisation process which depends precisely upon the degree of tolerance to infection and upon repeated reinfection—a point which has received further emphasis in the recent observations of Dr. McCanthy (*Brit. M. J.*, 1942:1:673). The use of this drug, under present condition, in prophylactic experiment, would appear inadvisable.

Many physicians in India, often use quinine as a routine treatment in almost all cases of fever at least for a short period. Although in normal times this method may have some advantage, the use should now be restricted to cases of malaria only.

The practice of using quinine in post-partum mixtures, should be discouraged unless there is positive indication for such use. Similarly, its use in surgery as a sclerosing agent with urethane may easily be avoided in view of other available drugs. The sulphate and hydrochloride, bisulphate and bihydrochloride are all that is necessary, the various other compounds and combinations recommended for ill-defined conditions may be deleted. Much quinine is also used in different contraceptive preparations (each pessary containing sometimes as much as 3 grains of quinine) and also in the so-called tonics. These may easily be dispensed with to conserve quinine for actual cases of malaria.

2. *Using the minimum effective dose*—The question of the minimum dose arose primarily for two reasons: (*i*) the need for determining the non-toxic dose of synthetic drugs: (*ii*) the desire not to diminish the natural defences, which are regarded as one of the most important factors in bringing about a real cure.

To these must be added the present quinine shortage and the necessity for conserving the same. Notwithstanding the various controversial statements the recommendations of the Malaria Commission of the League of Nations (1937) summarised below, will indicate to the general practitioners the guiding principles, while the initiative and the freedom of the practitioners remain unhampered in individual cases.

In order to cause the disappearance of the trophozoites of *P. vivax* during a primary attack, a mean daily dose of 1 G. of quinine hydrochloride is recommended for from 5 to 7 days. With such treatment the trophozoites disappear on an average on the third day and do not reappear until after a latent period of varying length in the course of the primary relapse.

A minimum daily dose of 0·5 G is sometimes sufficient to cause a temporary disappearance of trophozoites. In quartan infections the same effects are usually obtained but with infections with *P. falciparum* the average daily dose must be fixed at 1·30 G, while with certain strains of greater virulence, it is necessary to use 2 G. to obtain a rapid effect on the parasites. With the usual dose of 1 G, the trophozoites of *P. falciparum* disappear on an average one day later than in the case of *P. vivax*. Quinine, in the doses indicated, exercises its parasiticidal activities on the young forms of *P. vivax* and *P. malariæ* capable of producing gametocytes, as well as on the fully formed gametocytes, though the action on the latter is very slow. In the case of *P. falciparum*, the formation of pregametocytes is but little affected. Quinine may thus be regarded as directly schizonticidal and indirectly gametocidal in the case of *P. falciparum*. The treatment of primary infection due to *P. vivax* or *P. malariæ* with daily doses of 1 G is followed by relapses in a proportion of individuals which may be as high as fifty per cent. When applied in each attack quinine has proved to be of value in reducing splenomegaly in endemic regions, particularly amongst children. Its action is, however, transient if the community concerned is subject to a high relapse rate or is exposed to frequent infection. Further, in the treatment, the following factors should be taken into account if satisfactory results are to be obtained: (1) Species of the parasite, and more specially, the strain of the parasite, materially influences the response of the drugs; (2) the treatment must not interfere with the acquirement of tolerance: (3) the question of defective intestinal absorption.

In view of the observations in therapeutically induced malaria that better results are obtained if the infection is allowed to continue for sometime, it would

appear advisable to wait for 2-3 paroxysms to occur before the drug treatment is adopted to break the fever and not to prolong the treatment beyond 5 days. This will enable the natural defensive mechanism of the body to come into force.

There is no doubt, however, that often quinine has been hsed in too large doses and the treatment has been administered for too long a period. But since the different strains of *vivax* and *falciparum* vary in their sensitiveness to quinine no hard and fast rules can be laid down regarding the minimum amount of quinine required for curative treatment. Even the minimum of 1 G. daily for seven days may not be appropriate on all cases. In ordinary practice much depends on the time of administration and it has been our experience that most cases of benign tertian or quartan infection can be checked by giving quinine in 2 doses at least 2 hours before the expected paroxysm to enable the drug to circulate in sufficient concentration when the parasites are free in the peripheral blood. The 1st dose being 10 gr. and the 2nd 5 gr. given at an interval of 3 hours. No quinine should be given during the days the patient remains afebrile, but should be repeated on the days the paroxysm is expected. If 2 or 3 such paroxysms can be checked the chances are that the patient will be free from further attacks.

3. *Replacing quinine by totaquina*—Generations of physicians and the public believe that only quinine is the drug of choice in the treatment of malaria with the result that other alkaloids of cinchona are but rarely used. Quinetum or cinchona febrifuge containing all the alkaloids of red cinchona bark was first prepared in India in 1874 at the instance of Dr. Vriji.

The Malaria Commission (1932) introduced an improved and standardized mixture known as totaquina. type I from *C. succirubra* and type II from *C. ledgeriana* —the latter containing more cinchonine. The British Pharmacopoeia enjoins that it shall contain at least 70 per cent of crystallizable alkaloids of which one-fifth must be quinine and not more than 20 per cent amorphous alkaloids. More use should be made of totaquina and it will be found to be as good, if not better. than using quinine alone, besides being cheaper.

4. *Recovery of quinine from urine of patients treated with the drug*—Half the amount of quinine administered appears in the urine and a sugguestion (*Brit. M. J.*, 1942:1:152) was put forward to recover this. It is apparent that two persons treated with the drug excrete sufficient quinine for the third. But the practical application of the suggestion presents obvious difficulties.

5. *Production of more quinine or totaquina by extending cinchona plantations*—It should be emphasised that the present war has only aggravated a condition which was already present before its outbreak. The loss of Java has cut off the present supply and if it is true that the cinchona plantations have been efficiently "scorched"—the quinine famine would last many years than is anticipated. Further, the production capacity of a particular plantation declines with years. unless virgin areas are taken up. It is, therefore. necessary that immediate steps should be taken for extension of cinchona plantation in India. This question in its various aspects have been the subject of much comment from different quarters from time to time.

As early as 1928, the Royal Commission on Agriculture in India (1928) suggested an extension of cinchona plantation. This point was again emphasised in 1931 in the report of the Drugs Enquiry Committee. But unfortunately the action of the India Government in this direction does not bear any indication of a far-sighted and wise policy. Indeed the history of cinchona plantation in India beginning from 1861 to this day constitutes a subject of interesting study and bears the imprint of mismanagement.

The Indian Medical Gazette in its editorial of April 1941, (*Indian M. Gaz.*, 1941:76:225) made the following observation:—

"There are two ways in which the Governments in India could set about this problem; they could extend their present plantations, still growing the high-quinine-yielding *Cinchona ledgeriana* in areas suitable for its cultivation, but not limiting their planting to such areas and growing hardier species, such as *Cinchona robusta*, in other areas unsuited to ledgeriana cultivation, and in their factories manufacture a large preponderance of totaquina and smaller amounts of pure alkaloids; and/or they could encourage private enterprise in cinchona cultivation, and possibly in cinchona alkaloid manufacture."

The above was written before the fall of Java, since then things have changed and if it was relevant then, it is all the more so now. The tragedy of the thing lies on the fact that the Government of India kept their eyes shut for reasons best known to them, notwithstanding the advice and suggestions which were offered by men best able to give them.

By the time cinchona trees reach maturity—and it will take 10 years before any appreciable result can be expected from plantation started even at this moment—other sources must be explored not only for the *interim* period but for the future so that a situation as we are experiencing now may not occur again. These measures can be discussed under two distinct groups:—

(1) Manufacture of compounds of the nature of (*a*) atebrin, plasmoquin, etc., (*b*) sulphonamide type, (*c*) synthesis of quinine itself. (2) Investigation into the drugs of the indigenous systems with reputed anti-periodic activities.

6. *Investigating on a scientific line the many indigenous drugs of antimalarial value*—The use of cinchona and its alkaloids slowly replaced the many indigenous drugs which were formerly used in the treatment of malaria in this country. It cannot be said that India did not possess any anti-malarial remedy. But it requires more thorough and careful investigation and research to place them on a modern scientific basis. In order that some good and solid work may be done on this line it is necessary to proceed on a well thought-out plan. This requires the help of good chemists, pharmacologists and well-equipped laboratories where work can be undertaken. But here the Government also have great responsibilities. Such a work entails large financial help which the Government should face and different workers must be commissioned for such work in different laboratories and the work should be divided so that there may not be any overlapping.

We were faced with a similar problem during the last World War and its lessons were soon forgotten. We hope, however, that this time the Government will avoid doing the right thing in the wrong time.

7. *Finding out some synthetic products with a view to supplement the natural alkaloids or synthesis of quinine itself*—Investigations at Elberfeld, prompted by shortage of quinine during the last World War led to the production of synthetic compounds like plasmoquin in 1926 and atebrin in 1931, which proved to be of considerable value in the treatment of malaria. Since then a number of quinoline and acridine derivatives have been prepared and tested for their antimalarial value both experimentally as well as clinically. Results in some cases are encouraging. Researches on this line in India have only been carried by individuals. It is necessary that a collective effort should be made to this end.

The first observations with sulphonamides in malaria was made by Diaz de Leon in 1938 and since then several reports have appeared. It is possible that a better and less toxic compound of sulphonamide may yet be found which will be of greater value in the treatment of malaria.

Synthesis of quinine itself has been suggested to substitute or supplement the drug. It may be mentioned in this connection that compounds have been already synthesised on the pattern of the quinine molecule with antimalarial activity [Ainley and King (1938)—*Proc. Roy. Soc.* B., 125:60] and further work may lead to the synthesis of suitable analogue or quinine itself.

Compounds of sulphanilamide with alkaloids of cinchona have been already tested in infected canaries [Stuart *et al* (1939)—*J. A. Pharm. A.*, 28:90] indicating the line of further research as also the preparation of sulphonamide derivatives of 2-phenyl 4-amino-quinoline by Basu and Das Gupta (*J. Indian Ch. Soc.*, 1939:16:301).

The different drugs, when found, should be tested for their toxicity as well as for their effects in induced malaria, and before being finally released for use in the human patient, properly standardized in a laboratory not directly connected with the manufacture of such products, such as the Biochemical Standardization Laboratory of the Government of India or any other laboratory competent to undertake such work.

We have indicated briefly the various aspects of the problem and pointed out how these can be rectified. It is now for the Government of India to give this matter serious consideration. Will the D.G., I.M.S. give it a practical lead by forming a Committee of such men as are competent to advise the Government in regard to the different issues discussed here?

BERIBERI

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Introduction

The disease is known by different names. Endemic polyneuritis, Berbiers, Kakke in Japan and China and Ubbu Vatam or Thimmuru Vatam in Telugu probably representing the two different stages of the disease. The word beriberi is said to be derived from Sinhalese word meaning 'I cannot' meaning thereby that the patient is too ill to do anything, (Castellani and Chalmers). The word might have its origin from Hindustani dialect *b'hay-ree b'hay-ree* (sheep sheep) probably referring to its gait which simulates the gait of the paraplegic stage of beriberi (Pearse).

Definition

Beriberi is not easy to define as other tropical parasitic diseases such as malaria or kala-azar in which the causative organisms have been discovered. The diagnosis is made on clinical grounds only. Beriberi is a disease of young adults appearing in endemic areas sporadically or in epidemics; and is characterised clinically by œdema (neither of the cardiac or renal type), enlarged heart, tachycardia, systolic murmurs in the præcordium, low blood pressure both systolic and diastolic, increased pulse pressure and peripheral neuritis. The disease is also seen in infants and old people.

Historical

The history of beriberi goes back to 2600 B.C. when it was noticed in China. Hu Se-Hui, the Imperial dietist (1314-1330 A.D.) distinguished the wet and dry forms of beriberi. The first clinical description of beriberi was given by the Dutch physicians Jacob Brontius (1642) and Nicholas Tulp (1652). On the 3rd May, 1932, the Government of Madras offered a prize of Rs. 500 or a gold medal of that value to the best description of the disease called beriberi. Four essays were submitted on beriberi and the prize was awarded to J. G. Malcomson by a medical board of three members. He dealt in detail with the clinical aspect of sixty cases. Takkaki (1882), Director General of the Japanese Navy eradicated beriberi from the navy by increasing the daily allowance of vegetables, fish, meat and barley in a diet of which the staple article was rice. Eijkman (1890) working on beriberi in Java accidentally discovered polyneuritis in experimental animals. To economise the diet the fowls were fed on scraps from the wards of the military hospital and they developed polyneuritis. When permission was refused to feed these fowls on scraps, polyneuritic symptoms disappeared. Funk (1912) propounded the theory that beriberi, scurvy, pellagra and probably rickets were due to vitamin deficiency. Goldberger and Whiller (1926) separated vitamin B_1 from vitamin B_2. Janesen and Donath (1926) isolated vitamin B_1 in a crystalline form.

In India the first contribution on beriberi was made by Malcomson (1835). Kamath (1911) from his clinical observations in Vizagapatam submitted a thesis for M.D. of the Madras University. Nutritional research laboratories at Coonoor first under the direction of McCarrison and later under Aykroyd have made valuable contributions in the field of beriberi. A clinical study of beriberi was commenced by the author in 1929.

Clinical Aspect

Under the term beriberi various clinical manifestations are described:

(a) *True beriberi*—A condition usually occurring in young adults in which œdema, peripheral neuritis and cardiac disturbance are present. The clinical manifestations are different in infants and old people.

(b) *Toxic peripheral neuritis*—In this condition œdema is absent but tachycardia and peripheral neuritis are present. The main cause is the toxin of bacillary dysentery, in other cases the toxin is unknown. Cerebrospinal fluid is normal. Wassermann reaction is negative both in blood and C. S. fluid.

(c) *Avitaminosis B_1*—In this condition only peripheral neuritis is present, the other symptoms are absent. Cerebrospinal fluid is normal. Wassermann reaction is negative both in blood and C. S. fluid. Some cases show changes in optic nerve (Raman and Abbu, 1941).

(d) *Postpuerperal neuritis*—This condition occurs in women after delivery and in all probability it is a toxic peripheral neuritis. Vitamin B_1 deficiency is always present. This condition is more common in endemic areas of beriberi.

(e) *Protein deficiency œdema*—The patient is usually emaciated, œdema is present in the lower extremities, but cardiovascular and peripheral neuritic symptoms are absent. The condition rapidly improves with a liberal protein diet.

All the five clinical entities mentioned above can be easily differentiated at the bed side. The term beri-

beri should be restricted to the first group showing œdema, cardiovascular changes and peripheral neuritis. In infants, œdema, tachycardia and enlargement of the heart are necessary factors for the diagnosis of beriberi. Persistent cry and abdominal colic occurring in infants rapidly responding to vitamin B_1 should not be classified as beriberi but put in a separate group of avitaminosis B_1.

Ætiology of Berirebi

Beriberi is due to (1) deficiency of vitamin B_1 or (2) deficiency of vitamin B_1 plus some infection or toxin, the nature of which is still uncertain. Before the advent of vitamins the infection or intoxication theory was accepted. After vitamins came into the field beriberi was supposed to be due to deficiency of vitamin B first and later B_1.

McCarrison (1928) from his experiments on pigeons concluded that "A condition beriberi columbarum having all the pathological characters of beriberi has been produced under experimental conditions in pigeons by means of diet similar in composition to those in use by human sufferers from the disease. The condition differs from polyneuritis columbarum in certain regards of which hypertrophy of the heart is the chief." Megaw (1927) clinically distinguished beriberi from avitaminosis B. Mahadevan and Raman (1930) also distinguished clinically avitaminosis B_1 from beriberi and reported four cases. Williams *et al* (1940) failed to produce beriberi in man by complete deprivation of vitamin B_1 in the diet for a considerably long period. Clinically, the two conditions can be easily distinguished. Minor degrees of vitamin B_1 deficiency (avitaminosis B_1) are seen in nonendemic areas of beriberi. This observation has been confirmed by the Nutritional Research Laboratories at Coonoor. (Aykroyd *et al*, 1940). The more one studies the more one is inclined to believe that vitamin B_1 deficiency alone is not the cause of beriberi. Kamath who has made an extensive clinical study of beriberi, in his University Lectures in 1931, says "May I submit to you as a working hypothesis that symptomatology styled as beriberi is produced by a microorganism which spends a portion of its existence in the soil and another in the human intestinal tract; protein deficiency or decomposition, vitamin deficiency and perhaps yet other causes being all factors in exalting its virulence." McCarrison from a study of experimental animals says "The ultimate cause of the disease is not a negative factor but a positive and a toxic agent produced in the course of a disordered metabolism arising out of vitamin insufficiency." Megaw says "Beriberi is a name which has been employed for many years to designate cases of outbreaks of disease which occur mostly in rice-eating communities. In some outbreaks the diet is demonstrably deficient in vitamin B_1, in others there is no obvious deficiency of this factor." One of the recent contributions from the Nutritional Research Laboratories. Coonoor (Sundararajan, 1941), shows that deficiency of vitamin B_1 alone is not the cause of infantile beriberi.

Since vitamin B_1 has been isolated in a crystalline form and treatment is available by injection, research workers have gone back to the theory that beriberi is due to vitamin B_1 deficiency. This conclusion is not justified. Cases of rheumatic heart disease, myocarditis and essential hypertension showing signs of congestive heart failure rapidly respond to injections of vitamin B_1. It is quite possible that milder degrees of vitamin B_1 deficiency might be present in these cases in addition. After the introduction of vitamin B_1 injections, the mortality of beriberi has been reduced to a minimum. The residual paralysis that used to occur in acute pernicious forms is less severe, and the earlier the vitamin B_1 is administered in these cases, the less the paraplegic symptoms.

Summary of Observations

1. In India the disease is restricted to the endemic areas of Ganjam, Vizagapatam, Godavary, Kistna, Guntur and Nellore districts where milled rice is the main article of diet. The disease, however, existed in these areas long before the introduction of rice mills.

2. There is a definite seasonal variation, the maximum number of cases occurring in the months of August, September and October.

Seasonal Variation of Beriberi

	H. Q. Hospital, Guntur (Mahadevan & Raman). 1926—1929	*K. G. Hospital, Vizagapatam. 1937—1940*
January ..	18	9
February ..	21	15
March ..	32	13
April ..	30	15
May ..	32	17
June ..	46	14
July ..	43	10
August ..	80	23
September ..	61	25
October ..	88	35
November ..	35	12
December ..	24	12
Total ..	510	200

3. Relapses usually occur in the same patient in the same season of the succeeding years.

4. There is definite relation between the incidence of berberi and rainfall (Raman & Mahadevan, 1930).

5. Presence of fever is supposed to be a distinguishing feature of epidemic dropsy from beriberi. In the earlier stages of beriberi temperature varying between 100° to 101°F is not uncommon and is in favour of an infection. This fact was observed in cases seen both at Guntur and Vizagapatam.

6. A clinical condition called avitaminosis B_1 has been established in man which is different from beriberi. A similar differentiation has been made in experimental birds also.

7. Investigation into the diet of patients suffering from beriberi shows that there is a deficiency of vitamin B_1.

8. Acute and dying cases rapidly respond to injections of vitamin B_1. The action in these cases is to raise the vitamin B_1 content of the body above the threshold value for beriberi.

From a clinical study of beriberi for the last twelve years the following suggestion is put forward. Beriberi is due to deficiency of vitamin B_1 plus an infection by an unknown organism or the toxin produced by the organism which lies dormant in the endemic areas. Multiplying with the onset of rains it gains entrance into the human system probably by the oral route, and enters the blood stream when the vitamin B_1 content is below the threshold value, producing first the acute symptoms and later the symptoms of peripheral neuritis.

References

Aykroyd, W. R., Krishnan, B. T., Passmore, R., and Sundararajan, A. R. (1940)—*Indian M. Research Mem.*, 32:48.

Castellani, A., and Chalmers, A. R. (1919)—Manual of Tropical Medicine, p. 1671.

Harris, L. J. (1938)—Vitamins and Vitamin Deficiencies. Published by J. & A. Churchill, Ltd., London, p. 35.

Kamath, M. L. (1911)—Thesis for M. D., University of Madras, Madras.

Kamath, A. V. (1928)—*Indian M. Gaz.*, 53:535.

Malcomson, J. G. (1835)—A Practical Essay on the History and Treatment of Beriberi, Madras.

Mahadevan, V. and Raman, T. K. (1930)—*Indian M. Gaz.*, 55:355.

McCarrison, R. (1928)—*Indian M. Research Mem.*, No. 10.

Megaw, J. W. D. (1939)—Tropical Medicine. Published by J. & A. Churchill, Ltd., London, p. 440.

Raman, T. K. and Abbu C. (1941)—*J. I. M. A.*, 10:417.

Sundararajan, A. R. (1941)—*Indian J. M. Research*, 29:573.

Williams, R. D., Mason, H. L., and Smith, B. P. (1940)—*Arch. Int. Med.*, 56:785.

CHANCROID

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Chancroid or soft chancre is an ulcerative lesion which occurs on the external genitalia and is a slow-growing sore.

Etiology

In England this lesion is rare in private practice and in public hospital practice found mainly in sea port and dock areas as has been observed by Dr. Hanshell, Honorary Medical Superintendent, Seamen's Hospital, London. Harrison states that in England it is common to diagnose as chancroid any nonsyphilitic ulcer of the external genital organs of venereal origin and also to attribute to chancroid any inguinal bubo that is non-syphilitic and has appeared to follow a venereal ulcer or abrasion. Dr. Lees in recording his experience adds that chancroid is less prevalent in Europe and cases of true chancroids due to Ducrey's bacillus are rare in hospital practice.

Chancroid is a common venereal disease in India and is commonly seen in both hospital and private practice. Although I saw it occurring commonly amongst the poorer classes and sailors while working in the Venereal Department of the Calcutta Medical College Hospitals in 1939, but in my experience in Bihar I have found it equally distributed amongst the poor and rich and they form about 25 per cent of cases attending the Venereal Outdoor of the Patna Medical College Hospitals.

Chancroid is due to a specific bacillus called Ducrey's bacillus. It is a gram-negative, short chained, rod-shaped strepto-bacillus and does not form spores. This bacillus was discovered by Augusto Ducrey of Rome in 1889, whose observations were confirmed by Unna in 1892. Straus in 1894 reported that secondary infection was necessary to make successful inoculations with the Ducrey's bacillus. Ducrey's bacillus was first successfully cultured by Bezancon, Griffin and Le Sourd on an agar-rabbit blood medium and Teague and Deibert (1920) had grown 90 per cent successfully on sterile clotted rabbit's blood heated to 55°C for 15 minutes. Lately, Saelhof (1924) successfully cultivated by direct transfer to rabbit blood serum, incubating at 37°C for 24 hours and then transplanting to plates of

freshly prepared ascites-phosphate-agar containing 5 per cent sheep corpuscles and incubating at 37°C in the presence of an excess of moisture. Colonies appear in 24 to 48 hours.

Chancroid infection is always due to contagion following sexual intercourse. Petges and Sarrat (1937) report a case of soft chancre of the finger secondary to a genital soft chancre due to auto-inoculation.

Incubation period is much shorter in chancroidal infections than in chancre. Inoculation period is usually from one to three days but in a small proportion of cases it may be a week or longer but I have found that in majority of my cases the incubation period is hardly over 24 hours.

The site of chancroidal ulcers is on the genitals. The ulcerative lesions are usually formed in the coronal sulcus, involving both glans and prepuce. The ulcerative lesions are usually found on some part of the skin of the external genital organs or on the mucous membranes adjoining the skin surfaces. In some patients the perineal region is affected. The chancroidal ulcerations are frequently seen around the anus but are rarely seen in the rectum. According to Pean and Malassez, one half of the superficial anal ulcerations seen in females are due to chancroids. These are usually found between the folds of skin extending into the mucocutaneous surface; they are commonly multiple and sharply defined, the skin is macerated and the ulcers are painful when the sphincter is involved. In man the ulcer may occur on any part of the penis and particularly on the edge of the prepuce, frenum, glans, corona glandis and sometimes within the meatus. In females they occur about the vulva, the labia and the fourchette. Petges and Sarrat (1937) have reported an unique case of non-genital chancroidal ulcer and its diagnosis was confirmed by the appearance of a suppurating bubo in the epitrochlear gland and its immediate response to treatment with specific serum. Goodman (1925) has observed intraurethral chancroid confirmed by endoscopic examination and cultures taken from these showed Ducrey's bacillus.

Character of Chancroids

The first lesion may be single or multiple and each usually appears as a small pustule which quickly breaks down to form an ulcer. The typical induration of hard chancre is absent. The sore is irregular in outline and the edges are undercut and red with an angry looking or reddish areola. The surrounding tissues are not usually toughened though they may be œdematous and the ulcer is generally more flexile than is a primary syphilitic chancre. Size of the ulcer is half an inch or so and many ulcers combine together and cover a large area and may extend to the perineal and the pubic regions and even the whole scrotum and penis are involved.

The individual ulcer may remain quite small and regular in shape but usually increases in size rather quickly and becomes an irregular ulcer. Base of the ulcer is soft from which it has got its name soft chancre. The base is cribriform and is commonly covered with a slough or fragments of necrotic tissue.

The lesion is painful and sometimes exquisitely so on pressure and bleeds when handled.

The number is variable; usually multiple and sometimes a single ulcer is present. All the ulcers do not appear simultaneously but when syphilitic ulcers are multiple they appear simultaneously.

Four clinical varieties are met with: (1) Dwarf type is commonly seen when there is single infection with Ducrey's bacillus. It looks rounded and shallow and form 0·5 to 0·1 cm. in size. The duration is about six weeks and it constitutes about 40 per cent of cases. (2) Mixed type results from the simultaneous inoculation by the Ducrey's bacillus and spirochæta pallida. In a day or two after the sexual contact a lesion appears which clinically resembles a chancroidal ulcer but after about two to three weeks this ulcer develops characteristics of a hard chancre and thus in an early diagnosed case of soft chancre the Wassermann reaction becomes positive later on proving that to be a mixed infection. (3) Phagedenic type originates as either the dwarf type or the mixed type; the base and border of the ulcer are soon covered by a blackish mass and the periphery is red and infiltrated. The phagedenic chancroid is accompanied with pain, fever and severe constitutional symptoms. In some of these types syphilis is also present. It persists for months together. (4) Follicular type. It is the rare type and relatively difficult to be diagnosed. It originates in a hair follicle and looks as a tiny, deep-seated ulcer or as a soft, small, rounded ulcer with red halos with no tendency to extend and it is particularly seen over hairy regions, labia majora and pubic region.

Symptoms

The symptoms of chancroid are pain and a foul dirty discharge which is usually profuse. Fever is not

present but when there is a suppurating bubo present it may be accompanied by temperature. The bubo if not treated, points and ruptures leaving a deep, irregular, sloughing ulceration, which is quite similar to the genital lesion in its chief characteristics.

Diagnosis

Diagnosis is made by adopting the following methods: *Dark-field examination*—From the ulcer serum is taken before application of any antiseptic and examined by dark-field method. Spirochæta pallida are seen. As a routine, in every case of genital ulcer where there is a doubt we get the dark-field examination done and it is criminal to treat a case of genital ulcer as syphilitic in its early stage without confirmation. *Gram staining*—Slide preparation with the exudate shows Ducrey's bacillus and on Gram staining, Gram negative short chained, rod shaped, strepto bacillus are found. *Intradermal test* (Ito-Reenstierna's Antigenic test)—This test was introduced by Ito in 1913 and modified by Reenstierna later on. Vaccine prepared from Ducrey's bacillus when injected in very minute doses into the dermis produces an indurated erythema or wheal surrounded by a red halo in infected persons from 24 to 48 hours. There may be a general systemic reaction showing a sharp rise of temperature of 3 to 4 degrees above normal. The reaction is positive in 95 per cent of cases of infection by Ducrey's bacillus. The negative reaction in some cases is due to lowered tissue reaction. Sometimes it is positive when repeated after a few days or at a site close to the lesion. I choose the skin over the Poupart's ligament as the site for this diagnostic injection. Lately, it has been found that the pus aspirated from the bubo in a case of chancroid, when diluted 20 times in normal saline and sterilised at 60°C for one hour for three successive days forms a very good substitute for the pure vaccine. It is supposed to give 80 per cent positive results.

Cole (1935) observed that the reaction following the intradermal injection of 0·1 c.c. Ducrey vaccine is specific. At the end of 48 hours a papule 10 m.m. in diameter, surrounded by a zone of erythema 5 m.m. wide, denotes a positive reaction. Greenblatt (1938) found that the reaction becomes positive for the first time between 8 and 15 days after the appearance of the local lesion and Saunders *et al* (1939) think that a negative reaction after this time rules out a chancroidal infection in about 95 per cent of cases. Kornblith *et al* (1941) are of opinion that a positive reaction may mean that the patient has a chancroidal lesion at the time the test is performed or that he has had a chancroidal lesion at one time. The reaction remains positive throughout the patient's life and I have found in 72 per cent venereal cases giving positive reaction without any genital ulcer proving that he suffered sometimes in his life from chancroidal infection.

Table Showing an Evaluation of the Intradermal Reaction to Ducrey Vaccine (Kornblith, Jacoby and Chargin, 1941).

Clinical Diagnosis	*Number of Cases.*	*Number Positive.*	*Reaction per cent.*	*Number Negative*	*Reaction per cent.*
Chancroid with adenitis ..	33	33	94·6	0	5·4
.. without adenitis ..	60	55		5	
Control cases: No history or clinical evidence of chancroid or adenitis ..	117	3	2·6	114	97·4
Other diseases tested: Lymphogranuloma venereum with adenitis and positive Frei reaction ..	39	15	38	24	62
Granuloma inguinale ..	22	11	50	11	50
Syphilitic chancre ..	3	1	33·3	2	66·7

Wassermann reaction of blood—When the lesion is of some duration generally over 2 or 3 weeks, W. R. or Kahn test is done. If W. R. was negative before and positive at this examination, diagnosis of syphilis is established. If W. R. is negative it is to be done every week or earlier for six weeks and again at the end of the third month. If still negative, it is not syphilitic. Even when syphilis is present there may be mixed infection and culture from the lesion is important.

Biopsy—A bit of tissue from the edge of the ulcer is taken and a tissue slide is prepared. Histopathology will differentiate if from the malignant ulcer.

Differential Diagnosis

Chancroid is to differentiated from the following diseases:

Syphilis. An incubation period of only a very few days' duration, the absence of surrounding infiltration, comparative suppleness of the sore, and in the event of the sores being multiple, a history that they did not appear simultaneously are some of the points to be noted. Gummatous syphilide is distinguished by its hardness, comparative painlessness and response to the antisyphilitic treatment.

Herpes. The presence of a number of minute ulcers each of the size of a pin's head point to the diagnosis of the condition.

Gangrenous balanitis known as the fourth veneral disease. Usually it is more erosive than ulcerative. It is most widespread over the glans or inside the prepuce. The causative organisms are the spirilla and fusiform bacilli which occur in Vincent's angina and these can be found in secretions. If there is any suspicion that the condition is one of erosive balanitis rather than chancroid the specific remedy for balanitis, namely, hydrogen peroxide should always be freely applied.

Granuloma venereum. In places where it occurs rarely the condition is commonly diagnosed as chancroid. It is important to make the correct diagnosis as soon as possible because until antimony is administered parenterally it may spread widely over the genitals, the groins and even the buttocks. Although granuloma venereum is much commoner in warmer climates and among black races I have not seen any yet in Bihar. A few cases have been reported by Dr. Rajam from Madras. It usually progresses very much more slowly than chancroid; Drs. Nair and Pandalai of Andhra have described it as taking weeks or months to reach the size of a rupee. The growing edge and the bone commonly show vegetations or granulations which may break down leaving small punched out ulcers. There is usually a thin watery or bloodstained, sticky discharge with a characteristic odour. In the discharge may be found oval "Donovan" bodies like gigantic bacilli with rounded ends inside the mononuclear cells.

Venereal warts. These are situated in the coronal sulcus and biopsy will decide.

Squamous-celled carcinoma. The diagnosis is made by the long time it has peristed, its hardness and infiltration. In case of doubt biopsy and histopathological examination should be done.

Lymphogranuloma inguinale. Suppurative bubo is generally attributed first to chancroid and in most cases in which the course from the first swelling of the glands to their suppuration is rapid, this is correct. If, however, the progress is slow, the question of tuberculous disease, of lymphogranuloma inguinale or of climatic bubo should arise. In recent years it has been found that in cases of lymphopathia inguinale an intracutaneous injection of 0·1 to 0·2 c.c. of an antigen made with the pus extracted from an unburst bubo (Frei's antigen) produces a characteristic domeshaped papule which persists for a number of days, sometimes necrosing in the centre. At the same time Frei's test is carried out on the skin of one forearm. It is usual to practise a corresponding skin test (Ito Reinstierna's test) for chancroid by injecting into the skin of the other forearm of some killed culture. If the patient has suffered in the past from lymphopathia inguinale or chancroid, he will react to the corresponding antigen whatever the present condition may be.

Scabies. There is evidence of scabies in the web of fingers and other parts of the body and scratching.

Traumatic ulcer. It is rare and there is always history of trauma in such a case.

Paget's disease. It is very rare. I have not seen any yet in Bihar. Biopsy examination clinches the diagnosis.

Course

It is very variable depending on the type and location of the primary lesion and influence of treatment with presence or absence of complicating diseases. With treatment the common type is cured in five to six days; in phagedenic type healing takes place in some months and in mixed type the course is protracted.

Prognosis

It is good in common and uncomplicated type and is bad in presence of superimposed infection.

In syphilitic ulcers of penis there is induration at the base of the ulcer whereas in case of chancroidal ulcers there is no induration at the base resulting in the smooth passage of pyogenic organisms through the lymphatics into the inguinal glands producing early lymphadenitis which suppurate quickly, giving rise to a bubo.

Complications

Lymphangitis, lymphadenitis, lubo, extensive ulceration of the prepuce and hæmorrhage from frenum from the corrosion of the frenal artery are some of the many complications met with in chancroid.

Treatment

Prophylactic—Prophylaxis consists of: (a) Control and regular medical examination of prostitutes, establishment of venereal centres, (*b*) popular lectures to the public on social hygiene and (*c*) hygienic measures after exposure.

Curative—Local. The treatment of chancroid is local and non-surgical except for an occasional dorsal slit to give an access to the lesion or for suppurating bubo. This consists of hot fomentations—dipping the part in

hot hypertonic saline 4 times daily for two minutes, (*b*) dusting with flower of sulphur, iodoform, (*c*) application of mercurochrome ointment, 0·5 to 1 per cent which has proved of immense value in my cases which were protracted, as also application of antivirus ointment for chancroid.

General. General health should be improved by good diet and hygiene. Rest should be allowed as much as possible.

Specific treatment. Harrison (1938) observes that probably no pathological condition responds so well to vaccine treatment as chancroid. In 1923, Nicolle and Durand in France introduced a commercial product known as dmelcos vaccine employing killed Ducrey organisms. The initial dose of the vaccine is 0·5 c.c given intravenously for a man of average weight. The injections are given at an interval of 2 to 3 days and 6 to 12 injections are required. Barke (1940) recommends the following dose: 1st day 1 c.c., 3rd day 1·5 c.c., 5th day 2 c.c., 7th day 2·5 c.c., 9th day 3 c.c., 11th day 3 c.c. Vaccines prepared in India are very efficacious and peculiarly suited to the people suffering in India under tropical conditions.

Comparison of Dmelcos with other Vaccines Prepared in India

Dmelcos.	*Indian vaccine.*
(1) Given intravenously.	(1) Given subcutaneously.
(2) Injection is followed within four hours by a rigor and a sharp rise of temperature of 103°F or more.	(2) Injection is never followed by rigor and rise of temperature, or any other untoward effect.
(3) Cost per dose about one rupee or more.	(3) Cost per dose about four annas or less.

Chemotherapy. Sulphonamide by mouth, one tablet 4 times daily for 4 days is enough. Any sulphonamide is good but M. & B. 693 is the drug of choice with some. The dose recommended by the Whitechapel Clinic is: 1st week 3·0 gm. daily, and 2nd week 2·0 gm. daily. The earliest report of successful sulphanilamide therapy for chancroid came out in 1938. Of course, mild toxic phenomena such as occasional nausea, vomiting, headache, pain in abdomen were noticed in some of my cases but with the use of nicotinic acid these toxic symptoms have to a great extent been controlled these days. Sulphonamide injections when the disease is not responding well to vaccine therapy is advisable.

Local application of powdered sulphanilamide or in an ointment form has been found to be very successful in 72 per cent of my cases when used alone and combined with oral administration and vaccine therapy the results in my patients being cent per cent cure with the time of the disease appreciably reduced to a few days.

Burke (1940) observed that in rare instances both dmelcos and sulphonamides prove ineffective.

Surgical. Before the time of chemotherapy surgical intervention in cases of chancroid included incision and drainage of fluctuant buboes, the 'dorsal slit' of the prepuce, cautery being used freely and circumcision was a common treatment.

Kornblith *et al* (1941) have after experience in a large number of cases deferred circumcision after cure of a chancroidal infection for at least 2 to 3 months after all signs of local infection have completely subsided. The risk of poor healing or reactivation of sluggish organisms in the depths of the tissues if operation is performed earlier is always present but personally I have had the chance of doing circumcision in chancroidal cases where indicated in over 122 cases but fortunately in none of my cases there was relapse.

Treatment of bubo—The treatment was mainly operative formerly but with the advancement in our knowledge the treatment of choice at the early stage is the palliative treatment. Moist hot fomentations are given with application of glycerine-ichthyol-belladonna four times daily alone or with sulphonamide by mouth for 5 days, the dose being 3 gm. per day divided into 6 doses. For suppurative bubo, rest in bed is very essential (Harrison, 1938). It has to be evacuated by aspiration with a needle and syringe through the upper and outer end of the swelling. After evacuation, Harrison suggests, injection into the bubo colloidal silver, 1 in 2000 after which the puncture is sealed and bandaged. The operation may have to be repeated a few times as the abscess refills. If when first seen, the skin is so thin that bursting is imminent, it is best to make a small opening about 5 mm. long at right angles to the line of the groin at the inner end of the swelling and then to insert a small wick of gauze. Cole (1929) recommends making a slight incision of 1 cm. long in the base of the bubo, expressing the pus, applying a pad and bandage for 24 hours and then injecting, by inserting the nozzle of a record syringe, 1 to 2 c.c. of Menciere's solution (iodoform, guaiacol, eucalyptol and 95 per cent alcohol of each 10; balsam of Peru 30 and ether 100). After this a pad is applied for 48 hours before injection is repeated.

The latest advancement in the treatment of bubo is to inject Ducrey's bacillus vaccine in doses of ½ c.c. every fourth day into the bubo and 6 to 8 injections are given gradually increasing the dose. The success lies in the selection of cases for injection in bubo. If the injections are given when the suppuration has just started or before that period the result is almost 92 per cent cure but in cases when suppuration is very much advanced the injection of vaccine from Ducrey's bacillus is a failure and has only proved successful in about 10 per cent cases. I always try this treatment in early cases of bubo with success. In cases where suppuration has much advanced sulphonamide injections intramuscularly on alternate days with B. Ducrey vaccine injecton in the bubo give a more encouraging result.

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REFERENCES

BATCHLOR, R. C. L. AND LEES, R. (1939)—*Brit. M. J.*, 2:1017.
BECT, A. (1939)—*J. Hyg.*, 39:298.
BURKE, E. T. (1940)—Venereal Diseases, p. 98.
BRAMS, J. AND PILOT, I (1939)—*Arch. Derm at. & Syph*, 7:429
CANIZARES AND COHEN (1940)—*J. A. M. A.*, 116:2209.
COLE, H. N. AND LEVIN, E. A. (1935)—*J.A.M.A.*, 105:2040
COLE, H. N. (1940)—*Ven. Dis. Inform*, 10:1.
CRAWFORD, J. B. (1937)—Maingots Post-Graduate Surgery. Vol. 3. Published by Medical Publication Ltd., London, p. 1017.
CULP, O. S. (1940)—*Am. J. Syph. Gonor. & Ven. Dis.*, 24:622
DECKER, D. A., CANIZARES, O. AND REIDER, R. F. (1939)—*Arch. Dermat. & Syph.*, 40:397
ERICKSON, P. T. AND EAGLE, H. (1940)—*Ven. Dis. Inform* 21:31.
FIELDS, R. S. AND WEINSTEIN, S. S. (1938)—*Urol. & Cutan. Rev.*, 42:880.
GREENBLATT, R. B. AND DIENST, R. B. (1940)—*Ven. Dis. Inform*, 21:31.
GREENBLATT, R. B. AND SANDERSON, E. S. (1938)—*Am. J. Surg.*, 41:384.
GOODMAN, H. (1925)—*J. Urol.*, 13:489.
GOODMAN, W. D. (1926)—*J. Urol.*, 15:403.
GLICKLICH, E. A. AND SHERMAN, D. S. (1941)—*Indian J. Ven. Dis. & Dermat*, 6:62.
HARRISON, L. W. (1937)—British Encyclopœdia Medical Practice, Vol. 3. p. 97.
Idem (1940)—*Brit. J. Ven. Dis.*, 16:1.
HANSCHELL, H. M. (1938)—*Lancet*, 1:1047.
HUTCHISON, A. (1938)—*Lancet*, 1:1047.
JOHNSON, F. P. (1937)—Nelson's Surgery, Vol. 6, p. 81.
KORNBLITH, B. A., JACOBY, A. AND CHARGIN, L. (1941)—*J. A. M. A.*, 117:2150.
KORNBLITH, B. A. AND CHARGIN, L. (1938)—*Arch. Dermat. & Syph.*, 38,476.
KORNBLITH, B. A., JACOBY, A. AND WISHENGRAD, M. (1938)—*J.A.M.A.*, 111:523.
KORNBLITH, B. A. (1939)—*Am. J. Med. Sci.*, 198:231.
LAHIRI, K. D. (1942)—*Pat. J. Med.*, 17:51.
LEES, D. (1937)—Practical Methods of Diagnosis and Treatment of Venereal Disease, p. 418.
LEES, R. (1937)—*Practitioner*, 139:429.
MACDONAGH, J. E. R. (1920)—Venereal Diseases.
Idem, (1920)—*Brit. M. J.*, 2:660.
PUND, E. R., GREENBLATT, R. B. AND HULL, G. B. (1938)—*Am. J. Syph. Gonor. & Ven. Dis.*, 22:495.
PETGES AND SARRET (1937)—*Indian J. Ven. Dis. & Derm.*, 3:46.
ROSENWALD, L. (1923)—*Urol. Cutan. Rev.*, 27:553.
RANSCHKOLB, J. E. (1939)—*Arch. Dermat. & Syph.*, 39:319.
RICHARDSON, G. M. (1940)—*Brit. J. Ven. Dis.*, 16:166.
ROBINSON, H. M. (1940)—*South M. J.*, 33:144.
SAELHOF, C. C. (1924)—*J. Infect. Dis.*, 35:591.
Idem (1925)—*J. Urol.*, 13:485.
SAUNDERS, H. C., GANIZARES, O. AND REIDER, R. F. (1939)—*New York State J. Med.*, 39:447.
SANDERSON, E. S. (1940)—*Am. J. Pub. Health.*, 30:683.
SULLIVAN, M. (1940)—*Indian J. Ven. Dis. & Derm.*, 5:52.

XIX ALL-INDIA MEDICAL CONFERENCE, PATNA

The Reception Committee of the XIX All-India Medical Conference, Patna, regrets very much that, on account of the existing conditions prevailing in the country, causing difficulties of communication, accommodation and other facilities, the All-India Medical Conference, due to be held at Patna in December, 1942, is unavoidably postponed till the Easter holidays of 1943.

JOURNAL OF THE

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HOW MUCH GLYCOSURIA

The discovery of insulin by Banting and Best was one of those achievements which mark a landmark in the progress of medicine. Medical people were jubilant over it and it opened up a vista of hope before them, they need not cut down the poor man's diet, they need not restrict his movements, they need not be in constant dread of being called to see a patient dying of diabetic coma with nothing in their hand to help him. But the patient's point of view was quite different. With high hopes, he approached the doctor, who has promised him a cure from his crippling malady to find to his chagrin that it is a remedy full of so many inconveniences. He is to get pokes of the needle so many times a day and when he asks his doctor, 'Will insulin cure me?' He can get an answer, in terms of Lawrence,[1] in somewhat following words:

'Insulin cures diabetes as food cures hunger. Hunger recurs after a few hours, and the need for insulin also recurs. A wooden leg enables a lame man to walk, but not to grow a new leg. When the artificial leg is removed, he falls to the ground.'

Naturally, he says good-bye to his doctor, sends him to his insulin, and runs to the most advertised, nearest quack to learn a 'bitter lesson.' But the question brings, apart from economic factor, many and varied other factors in its wake. A patient may not be able to take more than one injection, he might not be intelligent enough to understand the import of the disease, or his normal walk of life, home surrounding, business hours may preclude him from taking the insulin injections. Hence the search was again started to find a better, more concentrated drug. Thanks to Hagedorn, who, in 1936, introduced to the medical world the insoluble compound of insulin, the protamine insulin.

1. Lawrence, R. D.—The Diabetic life. Tenth Edition, 1937. J. & A. Churchill, Ltd., London.

The protamines are simple proteins derived from the sperm of the fishes. These are capable of forming more complex proteins under suitable conditions. Hagedorn and his co-workres found out that at pH 7·2 protamine and insulin combine to form a fairly stable compound. The exact nature of the compound could not be determined. This drug was more slow in action and obviated giving two or more injections of insulin in a day. A further improvement was made by Scott of Toronto, by adding zinc to this compound.

Protamine zinc insulin, for the time being, seemed to be the ideal medicine for the diabetic. One is to give only one injection, it will form a depot and will be available to the body for a pretty long time, only thing is one shall have to work out the requisite dosages for injection. But the elation of the medical men was rather short-lived. Many disadvantages of the drug were found out, most important of which was a fatal hypoglycæmia in the early morning. So investigations were set up in two different directions, one the search for a better insulin and the other was to find out whether certain amount of glycosuria can be allowed in a patient.

Tolstoi *et al*[2, 3] consider that not only a certain amount of glycosuria in a patient can be allowed, it is the most reliable protection against hypoglycæmic syndrome. Joslin and others,[4, 5] however, have criticised this opinion rather sharply and pointed out that co-existence of a 5 per cent glycosuria and absence of any symptom is such an incompatible phenomenon that it should be taken with extreme caution. Nevertheless, they were ready even to disregard a 24-hour glycosuria upto 10 per cent of the total carbohydrate intake. So two questions arise, how much of the total carbohydrate intake can be allowed to pass out as glycosuria and what are the possible harmful effects of such a glycosuria.

Diabetes predisposes to infection and causes arteriosclerosis. Richardson[6] in his important work on immu-

2. Tolstoi, E. and Weber, F. C. Jr.—*Arch. Int. Med.*, 1939: 64:91
3. *Idem—Ibid*, 1940:66:670
4. Joslin, E. P.—Correspondence. *J. A. M. A.*, 1940:115: 1038
5. *Idem—Mil. Surgeon*, 1938:82:1
6. Richardson, R.—*J. Clin. Investigation*, 1933:12:1143
   Ibid, 1935:14:389
   Ibid, 1940:19:239
   Am. J. M. Sc., 1942:204:29

nity in diabetes has shown that resistance to infection, in term of immunity and phagocytic power of leucocytes is considerably lowered in the diabetics. This is, however, in contradistinction to the work of Tolstoi *et al*,[7] who studied one severe diabetic for four years, who managed to keep himself free from infection. But their results are not above criticism and contrary to all other work for example, the statistical work of Pollack *et al*.[8] These workers tabulated the fate of 997 patients studied over a period of seven years in a general hospital (Mt. Sinai Hospital) and their results quite agree with the established facts. Tolstoi's work on arteriosclerosis, however, is illuminating. He has shown that by röntgenograms no progressive sclerosis of vessels could be found. And further investigations in this direction should be done to come to any definite conclusion.

Regarding the first point, it is very difficult to formulate any dogmatic rule. Because glycosuria brings one danger along with it—acetonuria. Necessarily, one shall have to find out the amount of glucose that can be allowed to pass in the urine without producing any ketonuria. Every medical man of some repute will agree that quite a large number of mild diabetic patients, in this country at least, go about their ordinary business of life, without probably being aware of the fact that they are passing sugar in the urine. They do not suffer from any symptom and rarely consult a doctor. An investigation to find out the percentage of the incidence of benign glycosuria and the maximum amount that may remain silent, may give us some idea as to the amount of glycosuria one can allow in the patient.

7. Tolstoi, E., Almy, T. P. and Toscani, V.—*Ann. Int. Med.*, 1942:16:893
8. Pollack, H., Dolger, H., and Ellenberg, M.—*Am. J. M. Sc.*, 1941:202:246.

FIFTH BENGAL PROVINCIAL MEDICAL CONFERENCE

The Fifth Bengal Provincial Medical Conference will be held at Kankurgachi, under the auspices of the Kankurgachi Branch of the Indian Medical Association during the ensuing Christmas Holidays. Exact dates will be notified later.

As in previous Conferences, many important problems concerning the Medical Profession, War Emergency, Medical Relief, Services, A.R.P. Measures, Public Health with special reference to the problem of evacuation in rural areas, and Rural Medical Relief etc. will be discussed at the Conference.

The Scientific Section of the Conference will afford every medical man an excellent opportunity to know the advancement made in this country in medical science.

In order to make the Conference thoroughly representative and successful, it is fervently desired that all members of the Medical Profession of Bengal will appreciate the importance of the opportunity it offers and will kindly consider it worthwhile to attend the Conference and take part in the deliberations.

For particulars please write to Dr. Jamini Mohan Mallick, Hony. Secretary, Indian Medical Association, Kankurgachi Branch, 164, Manicktala Main Road, Calcutta.

CURRENT MEDICAL LITERATURE

MEDICINE

Recent Advances in Drug Therapy

Goodman (*Bull. N. Y. Acad. M.*, 1942:18:112) deals with the drug under 4 groups: (1) group 1 consists of drugs which are generally accepted and which are much used and that successfully; (2) group 2 consists of drugs which are widely employed but which need further investigation before being universally employed; (3) group 3 consists of drugs which are in the doubtful category and whose position is not so far properly assured; (4) group 4 consists of those drugs which hold very little promise and are not rational and destined for eventual discard.

Group 1. *Sulphonamides.* The author specially mentions the two newer additions to the family of sulphonamides, *viz.*, sulphadiazine and sulphaguanidine. He mentions a few special uses of these drugs. The local use of sulphonamide is extremely important and the prophylactic use in the quiescent stage of the rheumatic fever, scarlet fever contacts when the Dicks' test is positive, meningococcus carriers and after severe accidents and before severe operations is not without success. *Dilantin* in epilepsy has two outstanding advantages, *viz.*, it is not a sedative and it is of value not only in the control of *grand mal* but also in the treatment of seizures of psychomotor variety. *Plasma* is recommended as a blood substitute in the treatment of burns and traumatic shock. *Epinephrine and theophylline* are the two drugs mentioned for treatment in bronchial asthma. The use of epinephrine by inhalation is a recent introduction and there are some newer preparations of the drug. Theophylline is used in combination with ethylene diamine. *Synthetic atropine substitutes e.g.*, eumydrin, syntropan. These are antispasmodic, have no unpleasant effect of atropine and do not affect the cardiac rate. Syntropan has beeen recently used experimentally in labour where it has shortened the duration by 50 per cent. *Vitamins.* Thiamin and nicotinic acid should only be used where there are clear-cut, deficiences in nutrition; vitamin K is now used as a routine in jaundiced patients before operation, in hæmorrhagic diseases of the newborn and is sometimes administered to pregnant women prior to delivery. *Desoxycorticosterone* is mentioned in the treatment of Addison's disease and quinine in the treatment of myotonia congenita. *Papaverine*, one of the opium alkaloids is used intravenously as a vasodilator in the emergency treatment of embolism whether of peripheral or pulmonary distribution and is often lifesaving. *Heparin* is of use in the surgery of blood vessels, blood transfusion, prevention and treatment of thrombosis and embolism and in thrombophlebitis.

Group 2. *Digitalis glycosides.* The three native glycosides of digitalis are known as lanatosides A, B, C. When all three are employed they provide an acceptable digitalis preparation for oral use but this does not mean that such a preparation possesses any overwhelming advantages. Lanatoside C has been used intravenously—this is only warranted when the digitalis effect must be produced in minutes rather than hours and in this way it may be comparable in future with stropanthin. *Benzedrine* is used as adjuvant in epilepsy and Parkinsonism. Concomitant use of benzedrine obviates untoward effect and allows doses of phenobarbital which would otherwise be impossible. It is also a valuable adjuvant to the alkaloid of belladonna in Parkinsonism but it is useful only in postencephalitic Parkinsonism and not in arteriosclerotic type which is much more common. *Picrotoxin* is used in barbiturate poisoning —it is capable of lessening the degree of depression and stimulating respiration in patients poisoned by certain anæsthetic agents, specially the barbiturates. It must not be used in treatment of opium poisoning. *Curare and curariform drugs.* Curare acts on the neuromuscular junction and this has reduced the incidence of fractures and other injury caused by shock treatment of schizophrenia. It has been used with certain measures of success in patients with other nervous disorders, particularly in those with spastic paralysis and with torticolis. *Mercurial diuretics.* A preparation of salyrgan combined with theophylline has been used successfully by the oral route in approximately 70 per cent of the patients in whom it has been used. *Massive arsenotherapy* in early syphilis has been briefly described but very little has been written about it by other people. *Oral use of bismuth in syphilis* has been similarly mentioned. Three new drugs used successfully in parasitic infections are *phenothiazine, gentian violet and atebrin. Synthetic morphine substitutes* such as metapon, a methyl derivative of delaudid has been reported favourably. *Gramicidine*, a crystalline principle from the soil or rather from an ærobic soil bacillus kills gram positive cocci (0·005 of a mgm. of gramicidin kills 1 billion pneumococci or group A hæmolytic streptococci). Unfortunately it is at the present time water-insoluble and is also hæmolytic. Use of *penicillin* in bacterial infection. Penicillin differs from sulphonamide drug in the following ways: (1) it is more potent, (2) it completely inhibits bacterial growth even when the cultures are heavily inoculated and (3) it is not inhibited by tissue fluid. It is water-soluble and can be used by any route. It has been used in Oxford with success in such conditions as osteomyelitis, large carbuncles, conjunctivitis and in cases which failed to respond to sulphonamides. Diethylstibœstrol and progesterone have already established reputation as useful therapeutic agents.

Group 3 includes those newer drugs of questionable value, *viz.*, histamine, adrenal cortical hormone, renal antipressure extract and lastly the shock treatment of schizophrenia.

Group 4 includes those drugs which are either extremely questionable or irrational, such as pyridoxin in the treatment of Parkinsonism, alphatocopherol in the treatment of muscular dystrophies and testosterone in the treatment of prostatic hypertrophy, histaminase and potassium salts in the treatment of allergy and Bulgarian belladonna in the treatment of Parkinsonism.

Massive Aspirin Overdosage: Recovery

Oakley and Donne (*Brit. M. J.*, 1942:787) reports of a case in which recovery followed the taking of nearly 1,000 grains of aspirin. The conditions of the patient on admission to the hospital about 8 hours after her taking of aspirin were as follows: the patient was unconscious, restless and sweating

profusely, temperature 97°, pulse 120 and respiration 24; there was pronounced exophthalmos and extreme air hunger; pupils were fixed, knee- and ankle-jerks were absent and there was extensor plantar response on the left side. The authors maintain that the clinically outstanding features were the signs of intense sympathetic stimulation, such as exophthalmos and profuse sweating; of intoxication of the central nervous system such as coma, delirium, fixed pupils, absent jerks and extensor plantar response; of vasomotor collapse and dehydration, such as persistently raised pulse rate and low blood pressure and of acidosis as evidenced by deep abdominal breathing. The treatment of acute aspirin poisoning is thus essentially that of acidosis and dehydration with vasomotor collapse. Acidosis is best treated by large doses of intravenous sodium bicarbonate and glucose controlled by estimation of the alkali reserve at frequent intervals. Dehydration with vasomotor collapse should be treated in this condition as in diabetic coma, by large volumes of intravenous saline, plasma and eucortone.

Cardiac Infarction

Shillito (*J. A. M. A.*, 1942:118:734) in giving three guides to the prognosis in cases of coronary occlusion observes that shortly after the attack has occurred it is very difficult to prognosticate as to the outcome as the patient who is gravely ill may ultimately recover, while conversely, at any time and particularly during the first two weeks inspite of an apparently benign course, death may occur quite suddenly. The prognostic guides are: (1) a leucocyte count higher than 25,000, (2) a venous pressure of over 200 mm. of water and (3) a rectal temperature of over 104°F. The presence of any one of these factors warrants a grave prognosis. In the author's series all such patients died within 16 days after the onset of the attack and it makes no difference whether the attack is the first or one of the series. The author points out that electrocardiographic changes may be found for many months or at least long after the area of infarction has healed.

Treatment of Diabetes Mellitus with Sodium Phosphate

Joseph (*New York State M. J.*, Ref. *Med. World*, 1942: 56: 211) in dealing with the observations on the treatment of diabetes mellitus with sodium phosphate given in sublaxative amounts writes that under this treatment the glycosuria became reduced, general well-being improved and there was a greater tolerance for carbohydrates produced without any material increase in the amount of urinary or blood sugar. It is a preserver of sugar and appears to enhance the action of insulin, though it is in no sense a bustitute for that remedy (insulin actually utilises phosphates in the conversion of glucose into glycogen). In moderate amounts sodium phosphate augments the combining power of CO_2 and conserves the excretion of fluids in almost all true diabetic patients who is readily dehydrated. Its mild cholagogue action, moreover, lessens any tendency to constipation. It raises the threshold of sugar excretion in the urine and definitely lowers the amount of glucose excreted in the urine. It is of special value in the ambulatory patient who may be unable to follow a strict diet and to take insulin regularly. It is evidently a good synergist to insulin, not a substitute for it. It is thus a valuable adjuvant to the usual treatment of diabetes mellitus.

SURGERY

Surgery on the Diabetic

Thomas (*J. National M. A.*, 1942:34:112) points out that though diabetic patients constitute an increased risk for any type of surgery, the added risks are (*a*) insulin reactions. (*b*) acidosis and (*c*) increased incidence of arteriosclerosis. Proper pre- and post-operative care is really the essential feature in reducing the operative mortality of the surgical diabetic. The following pathological physiology of the patient must be taken into consideration before taking up the pre- and postoperative care of the patient, *viz.*, that there is hepatic insufficiency, that there is often an altered function of the kidney, that there is coronary sclerosis in 40-50 per cent of the patients, that their lungs are particularly vulnerable and congestion results from too long a stay in bed.

Preoperative care. *Emergency surgery.* Few cases exist where real hurry is necessary. Diabetic acidosis often simulates acute appendicitis; acidosis is treated first, if symptoms persist there is intraabdominal complication. Peripheral vascular failure is present in diabetic acidosis which must be treated with plasma, blood or acacia transfusion. After combating peripheral vascular failure insulin with or withouot glucose should be given. Dehydration should also be treated but saline must not be used in presence of peripheral vascular failure. Sodium bicarbonate and sodium lactate must be used to combat acidosis. *Elective surgery.* Here the diabetic should be completely controlled before surgery. There should be adequate glycogen storage specially in patients with considerable liver damage by the use of intravenous glucose, if necessary. In an infection with anæmia, a preliminary transfusion may be given. Sedatives should be omitted where possible, specially avoiding barbiturates. The safest anæsthesia is regional or spinal. If one has to resort to a general anæsthetic, cyclopropane is possibly the least harmful. The technique of elective surgery is the same as that followed in any nondiabetic patient with the following reservations: (1) no tourniquet should be applied in surgery of the extremities, and (2) no use should be made of local infiltration.

Postoperative care.. Some surgeon withhold fluid for 24 hours while others start these patients out on a soluble carbohydrate, liquids, sodium chloride by mouth every 2 hours immediately following surgery if there is no nausea or vomiting. It is best to depend on the blood sugar taken every 3-4 hours following surgery and then on the sugar content of the urine. Constant watch must be kept for hypoglycæmic shock and for this reason the attending nurse should be familiar with symptoms and signs and treatment of hypoglycæmia. She must also be familiar with the care of the skin and such principles as the prevention of burn and trauma. Rubber bed sheets should be forbidden as they may cause decubitus ulcer. There must be also co-operation with the medical staff as to insulin dosage. Next to insulin, proper maintenance of fluid balance is the most important part of the postoperative care. The internist should also be consulted as to the proper diet on the second day mostly with small frequent feedings of soft food. It is quite important that deep breathing and frequent changes of position be instituted immediately postoperative to

avoid hypostasis. These patients should be allowed to sit and move about as early as possible.

Diabetic Gangrene

Pennoyer (*New York State J. M.*, 1942, Ref. *Med. World*, 56:250) favours conservative treatment in cases of diabetic gangrene if the patient's life is not threatened by infection and gangrene becomes localised. Three principles must be applied in their conservative method of treatment. The first of this is *absolute rest.* Muscular rest is essential in order to conserve all the available blood supply for the feet. *Position* has next to be considered as gravity has an appreciable effect on the circulation; the head of the bed should be raised so that the feet are considerably below the level of the heart. Finally comes the *thermostatic control of the temperature of the affected limb* to about 92°F (this is the approximate temperature of the normal limb). Even a rise of 1 or 2 degrees in the temperature of the limb may imitate a burning pain in the affected leg and so, too, may a lowering of the temperature to below 90°F. This thermostatic control of the temperature often enables the patients to sleep comfortably without pain. Accordingly no form of heat should ever be applied.

Cholecystitis

Cutler (*Canad. M. A. J.*, 1942, Ref. *Med. World*, 1942: 5 :210) writes that chlolelithiasis is very common but if it exists without symptoms, no surgical interference is required. In cases of acute cholecystitis there is a history of pain beneath the right costal margin going on to local tenderness in the region instead or the pain and tenderness may be situated in the left upper quadrant (this is due to pancreatic involvement. Pain when it occurs, is constant, steady and not of a colicky nature as in chronic cases. In chronic cholecystitis there is most often a history of pain in the right upper quadrant; not more than 1/3 of them complain of epigastric distress. Epigastric pain, on the other hand, is experienced by patients with acute cholecystitis or with stones in the common bile duct. A small percentage gets pain in the left upper quadrant or the left infrascapular region, giving rise to erroneous diagnosis of angina pectoris. Vomiting is never a prominent symptom unless the stone is within the larger ducts. The typical history of cases of chronic cholecystitis is that of a vague indigestion with gaseous eructations, bitter taste in mouth and there is often a feeling of weakness in the back—such a history may extend over a number of years. When a stone is lodged in the common bile duct there are usually colic, vomiting, frequent attacks of shivering with fever but it must be remembered that small stones in the common duct may not cause any of these symptoms; they may never occlude the duct completely and so no jaundice occurs. Again, larger stones may lodge in small diverticuli and so permit of the free flow of bile, but even so, colic is generally present.

Chronic Prostatitis

Gandin (*New Zealand M. J.*, 1942:41:30) points that as a focus of chronic infection the prostate comes next in order to teeth and tonsils. We often fail to recognise the presence of chronic prostatitis because it possesses no special syndrome to suggest it. Nervous disease of the 'function type', rheumatism and gastro-intestinal upsets is the order in which the author would place those systemic disorders that may have their origin in the diseased prostate. If one finds nothing much amiss in such cases referable to the system affected, treatment of the prostate generally brings rapid improvement. A diagnosis may be made in three ways: (1) in the course of a routine examination of the prostate; (2) where a urinary tract infection fails to respond to careful treatment; (3) where a very thorough investigation of a presumptive diagnosis of, say, a renal calculus fails to discover such a condition. Local pain is seldom marked, but a sense of discomfort in the prostate is a common feature. It may be aggravated by a full bladder, a bowel movement or by jolting. Often it is noticed that the patient does not sit still and squarely in his chair but is restless and sits on one or other buttock. Slight frequency of micturition and one or two nocturnal disturbances are the rule. In most cases due to the presence of posterior urethritis there is frequency of micturition, slight discomfort which may amount to actual pain during and more particularly after micturition and slight hesitancy almot stickiness, the first thing in the morning. Voiding is usually accomplished easily with a full heavy stream but occasionally the stream is suggestive of stricture. There may be a slight urethral discharge. There is little more than a gumminess in the morning with perhaps a prostatic bead at stool. From time to time the symptoms may be more acute with increased frequency of micturition and the stinging pain after the act amounting to tenesmus. The only reliable signs in a case of chronic prostatitis are a prostate tender on palpation, and on massaging it a burning sensation in the urethra. The finding of quantities of pus cells will definitely decide the diagnosis. The importance of a rectal examination with a lubricated gloved finger must never be neglected in such cases.

Prevention of Urolithiasis in the Immobilized Patients

Stewart (*Illinois M. J.*, 1942:81:402) gives below the most desirable methods for the management of patients subjected to prolonged bed rest:

1. A forced fluid intake of not less than 2000 c.c. of water (soft) for 24 hours should be maintained. 2. Passive and active exercise and massage should be instituted whenever such measures are feasible. 3. Frequent change of position of the patient should be made; it is usually desirable to have the head of the bed elevated to facilitate drainage of the upper urinary tract. 4. Vitamin A should be administered in proper form and doses. 5. Urinary infection must be combated with drugs like sulphanilamide although mandelic acid is just as effective if the urine can be kept acid; sulphapyridine should not be used for its favouring the production of urinary calculi. 6. In patients with normal kidneys and normal or low calcium excretion the routine use of an acid ash diet, low in calcium and phosphorus which will keep the urine mildly acid is essential; if the urine cannot be kept mildly acid by diet alone, drugs must be used and these are ammonium chloride and ammonium nitrate (these do raise the calcium excretion and are definitely harmful if they do not make the urine acid) and sodium benzoate; in cases of persistent phosphaturia the administration of lactic acid cultures or acidolphilus milk will be of material benefit. 7. In patients who have an abnormally high calcium excretion the acid ash diet should be used with caution; if

infection is present a neutral ash diet, low in calcium and phosphorus, should be used; if stones are oxalate stones, a neutral diet with restriction of such foods as rhubarb, tomatoes, asparagus, cauliflower and string beans—in these patients butter milk may be of help; in presence of cystinuria and xanthinuria basic ash diets may be used. 8. As soon as the patient can be up and about and as soon as the urinary calcium has become normal the acid ash diet and large dose of vitamin A should be administered and maintained for at least 2 months.

Thrombosis of Intracranial Venous Sinuses in Middle Ear Suppuration

Lindsay (*Illinois M. J.*, 1942:81:467), basing on experience of 25 consecutive cases of proven invasion of the venous sinuses from middle ear suppuration emphasises on the following fundamental points regarding the care of this condition:

1. This type of complication whether it is already existent or only impending constitutes an urgent situation. 2. The first thing in the treatment should be chemotherapy—recent experience favours sulphathiazole as the therapeutic agent of choice; an adequate concentration of the drug (6 to 10 mgm. per cent) should be obtained as soon as possible—this relieves the urgency for surgical interference. 3. The second stage and the most essential of the treatment is adequate surgery. 4. The surgical treatment should accomplish two objectives in order to be adequate, the removal or adequate drainage of the focus of suppuration within the bone and adequate drainage or removal of the suppurating thrombus within the venous channels. Surgery should be carried out before other intracranial complications have developed either from the suppurating thrombus or from the focus within the bone, otherwise intracranial complications will have to be dealt with in the manner depending on the particular complications present. 4. It seems probable that adequate chemotherapy if given in all cases of severe middle ear suppuration at the onset of the disease will prevent the development of the complications of this type. However, when the disease has progressed to point of necrosis and breakdown in the cell system or suppuration within the thrombosed venous sinus chemotherapy alone will not do.

OBSTETRICS AND GYNAECOLOGY

Megaloblastic Anaemia of Pregnancy and the Puerperium

Davidson and others (*Brit. M. J.*, 1942:2:31) write that it should be recognised that a severe megaloblastic anæmia may occur during pregnancy or the puerperium although the color index may be unity or less. 16 such cases were reported and inspite of the administration of large quantities of liver extract, iron, and yeast, there was no response for a considerable time in a proportion of such patients. They further point out that the great majority of these refractory cases eventually make a complete recovery if life is maintained by blood transfusions along with vigorous hæmatinic treatment, the essential of success depending on the perseverance with intensive treatment. The authors lay great stress on the paramount importance of recognition of anæmia during pregnancy as only by this means can the acute exacerbations which tend to occur during the last two months of pregnancy be prevented.

Vitamin B_1 in the Urine and Placenta in Toxaemia of Pregnancy

Nixon and Wright (*Brit. M. J.*, 1942:1:605) from observations on a series of 106 cases of pregnancy among hospital populations report (1) that in eclampsia the amount of vitamin B_1 excreted in the urine on admission to hospital is significantly lower than in normal pregnancy and (2) that the concentration of vitamin B_1 in the placenta is also significantly below that of the placenta from normal cases. In view of these findings and the occurrence of œdema and suppression of urine in eclampsia, offering a striking similarity to the clinical picture of beriberi it is suggested that vitamin B_1 thereby may be beneficial to such patients.

Treatment of Erosion of the Cervix Uteri

Smythe (*Med. Press & Circ.*, 1942:207:372) writes that in the treatment of erosion of the cervix the main points to be borne in mind are the age of the patient and the presence and extent of the cervical laceration.

Simple erosion without laceration of the cervix—this is usually the result of a congenital abnormality in which the area around the external os is covered with cubical epithelium and glands and not by stratified epithelium. This is best treated by means of cauterisation of the eroded area either by the actual cautery or iodised phenol; douching should be avoided as unless great care is exercised infection of the erosion results. If the erosion is due to chronic gonorrhœal infection of the cervix the first indication is to clear up the infection by a series of application of diathermy (electrode placed within the cervical canal) and once the gonorrhœal infection is controlled then astringent douches or cauterisation will clear up the erosion.

Laceration of the cervix complicated by erosion. Here laceration is the primary lesion, the erosion follows as the result of infection of the lacerated area. In women during the child-bearing age with lacerations and erosions we have three methods of treatment, *viz.*, (1) cauterisation with the actual cautery, (2) cervical repair and (3) amputation of the lacerated portion of the cervix. In cases with a small unilateral or bilateral laceration, even if the erosion is hypertrophic with small adenomatous polyp, cure can be usually effected by means of cauterisation of the cervix. Astringent douches given after cautery will assist in the cure. Cases with a severe laceration or lacerations exposing a length of the cervical canal are not suitable for cauterisation and the alternative treatments are either to repair the lacerated cervix or amputate the lacerated portion. Results of cervical repair are not satisfactory except when it is done after a recent laceration. In cases of severe laceration and erosion during the child-bearing period amputation of the lacerated portion of the cervix is the operation of choice. There is frequently an accompanying endocervicitis and endometritis and these conditions can be dealt with previous to amputation by dilatation and curattage. Decreased fertility is the only objection to the operation. If pregnancy does occur the shortened cervix acts in the normal manner and presents no difficulty

in dilatation at the confinement. In patients nearing, during or after menopause severe lacerations and erosions demand amputation of the whole portion of the vaginal cervix. Erosion of the cervix is a precarcinomatous condition, specially so at the menopausal age and after and therefore, must be treated drastically. If there is any suspicion of malignancy at this period *e.g.*, bleeding on examination or coitus then a total hysterectomy should be done in order to remove the whole of the cervix. A great stride in the prevention of carcinoma of the cervix is the treatment of lacerations and erosions in their earlier stages.

TROPICAL MEDICINE

Microfilarial Granulomata of the Spleen

Dhayagude and Amin (*Am. J. Pathol.*, 1942:18:351) describe multiple gross nodular lesions of microfilarial origin seen in the spleens obtained at autopsy, from 11 patients in the King Edward VII Memorial Hospital, Bombay. More than half of these patients died as a result of injury and their stay in the hospital varied from a few hours to 3 to 4 days. The spleens bearing the lesions were largely normal in size and weight. The nodules varied in size from 2 to 25 mm. and usually were multiple and on cut surface presented a reddish or reddish brown appearance quite distinct from the chocolate colour of the splenic tissue and were sharply circumscribed, occasionally two or three of them merging in one large nodule. Histological studies revealed two types of reaction—in one hyperplasia of the reticuloendothelial cells was a pronounced feature while in the other the sinuses showed marked dilatation and engorgement with red cells. Irrespective of the type of reaction the lesions invariably showed eosinophilic infiltration, either focal and intense or diffusely scattered. There were also a varying number of giant cells and the lymphocytes were an inconspicuous element in the nodules. Every one of these lesions, irrespective of the extent of eosinophilic infiltration, showed the presence of microfilaria on cut section. The microfilariæ were found concentrated only in the nodules whereas in the surrounding splenic tissue they were rare and scattered and were lying in lumina of the blood vessels; the reaction in the nodules was undoubtedly directed towards a limitation and possibly destruction of the larvæ present and lastly in some of the sections microfilariæ were seen in different stages of disintegration—these were some of the evidences put forward by the author to prove conclusively that these granulomata were microfilarial in origin.

Differential Diagnosis in Leprosy

Arnold (*Arch. Dermat. & Syph.*, 1941:44:911) writes that it is not enough to exlude leprosy by getting only negative results to examination of nasal smears or to tests of sensitivity to light touch or pin prick. The principal diagnostic criteria are: almost any form of skin lesion or none at all; thermal anæsthesia, even in apparently normal skin; muscular weakness or paralysis, most easily noted in the facial muscles; irregularly thickened nerve trunks; acid-fast bacilli in smears from skin or scraped nasal septum; histological changes. Of these criteria the most important is thermal anæsthesia, which is almost invariably present in leprosy—this is by no means true of anæsthesia to light touch or to pin prick; thermal anæsthesia can be easily tested by hot and cold test tubes.

SPECIALISM IN MEDICINE

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A young doctor returned to his native village and called upon the old family physician. "I suppose you intend to specialise", remarked the latter. "Oh, yes", replied the young man, "in the diseases of the nose, for the ear and throat are too complicated and extensive for purposes of study and treatment." Thereupon the family physician enquired, "Which nostril are you concentrating on?"

Reading the signs of the time, specialism in medicine in general stands unextolled. The utility of specialists may be gauged by standards, some of which exalt while others decry specialism. Medical treatment is still influenced by two opposing forces, *viz.*, the impulse to heal the sick and the compulsion to explain diseases and their causation. But the final, ultimate and only touchstone is man, his health and happiness. Gauged by this criterion specialism in medicine has gathered some evidence to condemn it. Such outbursts have their pitfalls, but nevertheless serve a better cause than balanced vaudeville dance of views.

The evolution of specialities in science traced backward go to a period when increased data, observation and hypothesis demanded the votaries of science to restrict themselves to limited fields. In the prechristian era seekers of truth were 'omnivorous' according to modern conceptions. To which science of today does Aristotle belong, physics, natural science, medicine, or philosophy? He is sometimes counted a symptom of degeneration. But for a thousand years after his death it was forbidden to cast doubt on the Bible and Aristotle. He tried to bring within the compass of a single analysis, the whole sweep of human knowledge. He tried to build up a scientific system of information to serve as a basis of life. His versatility has spontaneously provided tribute from man for 23 centuries. That was perhaps possible because knowledge was limited. Though to many physicists Aristotle was mentally distorted, there is no gainsaying that he sought truth in many channels. Illustrations from the dark and middle ages are of no avail. But some of the outstanding figures of the Renaissance were essentially 'omnivorous' and owe their position to their non-specialism. To which science or art of today does Leonardo da Vinci belong, painting, physics, sculpture, engineering or is it the art *cum* science of music? With Leonardo the distinction between art and science seems to break down. He collected pebbles in great number like Newton and of many kinds too. Could it be said that had he given up science and specialised only in painting he would have done better? Biographers and commentators in Russian, French, English and German all agree that this versatility was his strength. The Last Supper was not the blossom of an exquisite painter but the fruit of a versatile mind.

To which science is Rene Descarte a votary? The name of Descarte is familiar to the philosophy faculty, through his 'Meditations' and his 'Cogito ergo sum' but his profound mathematical gift, scientific investigations in the realm of mechanics and astronomy entitle him for a place outside philosophy as well.

But this 'omnibus' method could not last long. Extensive observations and data necessitated experiments and hypothesis and enunciation of corollaries. This demanded in turn restricted fields. This restricted field for action certainly had its gains but also it surrenders material quantitative gains but qualitative change in outlook materially. Restricting specialism to medical science, increased knowledge of man and disease divided medicine into subjects, subjects mastered individually at first to grasp man in his entirety in reality. To that extent splitting of medicine into subjects or specialities was justifiable. But further split into specialities was the outcome of very different trend of events. Specialism in medicine was classified by Traquair (1941) as follows: (1) organ specialists, *e.g.,* oculist, dermatologist, otorhinologist, cardiologist, gynæcologist, neurologist, etc.; (2) disease specialist, *e.g.,* venereologist, tuberculogist, psychiatrist, specialist in infectious fevers; etc.; (3) treatment specialist, *e.g.,* radiotherapist, psychotherapist, pharmacotherapist, vaccine therapist, balaneologist, etc.; (4) diagnosis specialist or laboratory medical man, *e.g.,* pathologist, bacteriologist, biochemist, etc.

What called for these specialities or the motive underlying these specialism is difficult to get at. The word specialist has a hypnotic influence on the public mind that the demand for specialists is the outcome sometimes of an emotional background rather than a rational necessity. The incentive sometimes hails from an erroneous conception of the maxim 'Drink deep or taste not the Pierian spring'. Medical science has become so voluminous that a normal man with his limited capacities could not drink deep of the entire science and therefore, (modestly) constructed partitions (to hold). But the pace at which specialism in medicine is moving is decidedly menacing. Intensive activity in a very limited field defeats ultimately its own end. It tends more and more to separate the parts of knowledge from each other. This cannot help to survey man as a whole and our conception of his illness should remain a contradiction and muddle. The increase of medical spcialism is not so much an evidence of advance as it is the helping of uncoordinated observations. Decreased range stultifies the perception and bearings of a specialist.

The specialist becomes a collector of facts with regard to a case, while a general practitioner continues to be a selector of facts pertaining to a patient.

The result of modern specialisms in medicine may be considered (1) from the point of view of man, his illness, cure and happiness and (2) from the point of view of the science of medicine, its vitality, robustness and progress.

Man, his illness, cure and happiness—To realise the situation one has to sit in an out-patient department of a big hospital attached to a teaching institution. The order of the symptoms that come out of the patient's mouth determines to a large extent his career in the infirmary. He is directed to one specialist who assessing one symptom of graver import, pushes him to the next specialist. The doubt, diffidence of that specialist who deals with specimens of emanations, excretions or bits of the patient, utterly oblivious to the nature of the biped who supplied him the specimen, gives his verdict with an oracular gravity in a special report of his after his gaze on the test tubes, their reagents, the slide, the microscope or the skiagram. By this time the patient had spent several days and a good bit of the spirit to get himself treated. Depending on the nature of the verdict of the laboratory specialist, the patient is put on a treatment and assigned to the specialist in that field. The treatment is the result of the laboratory diagnosis and has precious little to do with the patient in his entirety.

A patient with rat bite turned up at the outdoor of a hospital attached to a teaching institute. The medical man sent him to the bacteriologist for the detection of the spirillum. The bacteriologist gave a positive result and sent him back to the physician. The physician not finding a protozoologist (for spirilla are still deemed protozoal organisms) sent the patient to the venereologist, he being primarily a spiriochætologist and a specialist in arsenic therapy. The venereologist noting that rat bite fever is not a venereal disease, sent him back to the physician, but before going to the physician directed him to the surgeon as the finger was festering. The patient could not be traced after this.

The doctor has reduced himself to the position of a receptionist in a department store who directs each customer to the appropriate department, to be ultimately informed that all except what he seeks are available. The one track specialist is bound to be a bad curative artist for he finds in all patients that go to him either his own speciality or nothing else. The organ specialist often finds that his organ shows involvement or a diathesis, the disease specialist that his disease is showing evidence, the treatment specialist that his treatment alone could give relief and the diagnosis specialist is fairly certain that his method alone can throw light on the nature of the disease. No one is ailing from egotism, but the specialism tends to confer myopia. The fault lies not with the specialist but with the incoordinated system of medicine and the competitive medical times.

At a B. M. A. centenary, Sir Robert Hutchinson (1932) bemoaned the splitting up and isolation of branches of medicine. Addressing the medical undergraduates in America, William Mather Lewis (1939) said, "The undergraduate should stand against too early specialisation and the pursuit of ideas which will lead later in life to vocational maladjustment. It seems obvious" he continued "that the medical profession because of the great development of scientific knowledge has suffered from too early and complete specialisation. To the lay man this appears as the reason for the doctor to look on patients as cases and not as human beings." And at the formative university stage if the spirit of specialism is inculcated, it perforce tends to displace humanities and patients become cases.

J. D. Bernal had published a book in 1939 entitled, The Social Functions of Science. The *British Medical Journal* in reviewing the book in its leader 'Science and Society' said that one of the reasons for the decadence of medical science today is that the scientists themselves are often almost wholly engrossed in their own subjects, sometimes very narrow fields to the exclusion of wider interests and culture. If medical science has failed to promote man's physical happiness, undue specialism is certainly one of the incriminating factors. For human wellbeing is dependent on the science of life and mind and specialist sciences in medicine have come short of the demand.

In certain medical insitutions in Amarica the systemic lectures in medicine do not consist in following a textbook taking diseases one by one on some comfortable principle. The

student is made to learn and appreciate seated next to a patient, the fundamental nature of diseases, the fact that it manifests itself very different in varying types of patients, that he is required to be something more than a mere scientific observer, that psychological aspects of illness may profoundly vary text-book signs, etc. A specialist outlook never conduces to this, for diseases focus the attention and not the patient. D. W. Profst (1939) in his The Patient is the Unit of Practice (published by Baillier and Tindall) describes at length such a course. The spirit of the book is in conformity with the maxim of Sir William Osler, "The medical student begins with the patient, continues with the patient and ends with the patient using books and lectures as tools as a means to an end." The specialist looks at a patient as though he is a compound of four buckets of water and one bag of salt and that his business is to determine the variation in concentration of certain salts that cause the disease. The specialist in medicine in the extreme believes in the mechanistic view of life and not the biophysical.

Science of medicine, its vitality, robustness and progress—Superficial study of the history of medical science may give the impression that specialism conduces to the robustness of the science and gives fillip to its progress. Certain facts tend to discountenance this view. While high browed *ad hoc* researchers were groping in the dark about the etiology of epidemic dropsy, a humble general practitioner of the licentiate standard I think in a rural area with unbefogged eyes suggested the posibility of mustard oil. Has it since been accepted? Nature seldom reveals her screts to *ad hoc* hunters, but surprisingly and from least expected quarters truth presents to any in the pursuit of his unspecialised routine. A great researcher once remarked that the great national appeal for cancer research has actually killed cancer research. For, the man who has been working quietly and steadily in his own way is likely to be absorbed into an institution, his initiative crushed because he has to work along a plan. He felt that cancer was likely to unfold its mysteries to a general practitioner. Team work in institutions have been tried but men of experience are looking forward to the funeral rather than the festival!

The physician who limits his knowledge to a group of so-called diseases or organs does not acquire real knowledge because disease is of the whole body and mind and local diseases are only terminal and partial manifestation. The American Medical Association has approved 15 specialities but has also made sure that specialism is not of a too narrow nature. However much a candidate may wish to shine in his small field he must first qualify as a competent general physician or surgeon. "Thus what at first glance looks like approval of specialisation *ad infinitum*, is not accepted by this board and there is no immediate danger of realisation of the old platitude about different specialists for each tonsil" (1941).

A fundamental distinction has been drawn between a surgeon and a physician. Surgery tends to get analytical while medicine is synthetic. The superior surgeon is one who specialises in one group of exploration and operation while the superior physican is the complete internist and the one who considers and treats the whole of the patient and the patient as a whole.

Dean Inge in Freedom and Truth observes, "It is, however, fair to remember that narrowness is the nemesis of all specialism".

If a Bernard Shaw or a Wells should contemplate a dram depicting the Doctor of the future, he might well put on the stage eminent consultants who had specialised in the rouget cells of the capillaries discussing diagnosis with colleagues who had devoted their speciality to a single uriniferous tubule and its response to a sympathetic twig, or a specialist in the slit for the olfactory nerve discussing in the Maudlin library with authorities on hair growth on the dorsum of the middle phalanges. "Injection" with the lower grade and "Specialists" with the better class of society are catchwords and their use has led to many abuses which the profession should deplore. The word has no legal or official recognition and may be employed by all and sundry without hindrance or penalty. Popular advertisements in the dailies by selfanointed specialists in 'piles' and 'leucoderma', 'leprosy' and 'hydrocele' and 'hernia without operations' cannot fail the readers' attention but this is not what is primarily referred. The good all-rounder is the desideratum of universities and schools. Some one said that a specialist differs from an all rounder as 'Pose' differs from 'Poise'. Only an 'i' distinguishes the two but it is a capital 'I' for while a specialist is often a poser or an egotist the all-rounder is one with a poise, a philosopher and an altruist! Prof. Ryle (1939) went so far as to distinguish two types of medical men, *i.e.*, the one with clinical sense and the one with clinical science. Specialists were often men of clinical science but not with clinical sense. It would be a bad day when the general practitioner lost his place or is looked askance by the profession for he is the expert on man in his entirety. If medicine is to pass more and more into the specialist who is at best a regional one, track observer of the ailing man, the knell for the science of medicine is rung. The simple entities of the clinical period of yesterday are the complexities, multiplicities and abnormalities of today. Many a so-called speciality of today had to expand to its status by gathering round itself heaps of basic, fundamental roughage that the person of man to whom it should apply has escaped by the side door. Many specialities in medicine have become pure science and however much enthusiasts may laud pure science, its ready or immediate applicability to man should mainly determine its utility. For Robert Boyle (1941) true science was such knowledge 'as hath a tendency to use'. For Francis Bacon (1941) it is 'such philosophy as shall be operative to the endowment and betterment of man's life'. Pasteur's fundamental discoveries were inspired by utilitarian purposes. The doctrine of experiment for experiment's sake is as false as art for art's sake. The laboratory specialist in medicine is bound to be sterile if he is completely removed from the practice of medicine like Antæus in the grip of Hercules no longer regaining strength from contact with earth.

The choice before the medical profession today is to know less about more and more or more and more about less and less. This may be a tricky business, if not dangerous. But if we continue assiduously on the narrow lines of specialism and pursue the outlook now prevailing, it is not impossible that our successors will discover that we have been barking up the wrong tree. For the branches of specialism are disconnected from the tree and the stump tends to remain bare and to rot. The late Sir Clifford Allbutt went so far as to refer to the radical division of surgery from medicine as a conspicuous

example of the incalculable evil wrought by lack of integration and as one of the mischievous legacies of the middle ages. (*Edinburgh M. J.*, 1941: :52). The development of team work tended notably to increase the risk of distracting attention from the patient as a person and to regard diseases as entities and not the reaction to noxious external and internal environment. And who constitute the team but the specialists? Dr. Cranby Robinson in his book, The Patient as a Person, published in 1939, quotes Doches who contrasts the records of two patients with heart disease, one admitted to a hospital 25 years ago and the other to the same hospital in 1938. The former was treated by three persons and the record covered two pages and a half. The latter was observed by 32 specialists and the uncompleted record covered 29 pages, uncompleted because the post mortem report had not yet come! Doches asks 'Is Medicine suffering from delusions of grandeur today?'

Lancet in its editorial in the March 1st, 1941, issue discussed the subject of 'Research in General Practice'. Medical science is there compared to the man in the parable who sought the temple of the ideal located on the summit of an almost inaccessible mountain for 40 years. After some effort he scales the mountain to learn that the temple was in the valley he had left. Some searching questions are there raised. Do we identify the technically difficult with the important? Cannot simple methods disclose profound truths? Is it possible that if medical neighbours and friends met once a year and pooled their experiences, discoveries might be made which had escaped the ministry of health and the research units of teaching hospitals and *ad hoc* research organisations? Should there be a spectacular analysis of records and the profound ritual of the white coated priests with guineapigs in their hand and glasses slipping down their nose?

These are sign posts pointing to the Hippocratean maxim of the 4th century B.C. to return to the study of man in his entirety, the whole of things, in attempting to cure and, in the progress of science. In so doing medicine gets more not less scientific and specialism gets less not more scientific.

Scientists in the early days were 'omnivorous'. This was possible as knowledge was limited and subsequent accumulation of knowledge necessitated specialism. But are there dangers to modern medicine because of undue specialism to-day? This is considered from (*i*) the point of view of man, his illness, health and happiness, (*ii*) the viewpoint of medical science its vitality, robustness and progress—the scope of *ad hoc* research and research by general practitioners. A plea to the vast number of general practitioners who are more fitted than specialists and sometime even *ad hoc* researchers may contribute to research in medicine. Specialists should be on the guard against narrowness in outlook.

References

Bacon, F. (1941)—*Nature*, 145:428.
Bernal, J. D. (1939)—*Brit. M. J.* Editorial, 2:286.
Boyle, R. (1941)—*Nature*, 145:428.
Hutchison, R. (1932)—*Lancet*, 2:741.
Kersner, H. T. (1941)—*J.A.M.A.*, 117:1.
Lewis, W. M. (1939)—*J.A.M.A.*, 112:222.
Ryle, J. A. (1939)—*Brit. M. J.*, 1:1049.
Traquair, H. M. (1941)—*Edinburgh M. J.*, 48:52.

NOTES AND NEWS

THE INDIAN PHARMACEUTICAL CONFERENCE

The third session of the Indian Pharmaceutical Conference organised by the Indian Pharmaceutical Association will be held at Lucknow from January 2nd to 5th, 1943 under the presidentship of Prof. M. L. Schroff, A. B. Hons., M.S. (Mass.), Raja Motichand Professor and Head of the Department of Pharmaceutics, Benares Hindu University. There will be several symposia and lectures on important pharmaceutical subjects.

THE IMPORT TRADE CONTROL SCHEME

The Government of India have for some time been considering the question of revising the present method of control of imports of drugs and medicines from abroad to ensure that only the most suitable medicines and in the most suitable quantities are imported under the Import Trade Control Scheme.

They have now decided to set up for the purpose an Advisory Panel on Drugs and Medicines with the following terms of reference:—

"To advise the Government of India as to which drugs and medicines, other than those the formulas of which are included in the Official Pharmacopoeias of the exporting countries, it is essential to import into India from abroad."

(Note:—The term 'Official Pharmacopoeias' includes the British Pharmacopoeia, the British Pharmacopoeia Codex, the United States Pharmacopoeia and the National Formulary of the United States of America).

The Panel will consist of officials and non-officials and will include representatives of the drugs trade and industry as well as medical and scientific experts. Its work will largely be conducted by correspondence. Ultimately, however, it will meet at the headquarters of the Government of India when the state of final decision has been reached.

The following are the members of the Panel:—1. Brevet Colonel Sir R. N. Chopra, C.I.E., I.M.S. (Retd.) Director, Drug Research Laboratory, Jammu and Kashmir State. (Chairman). 2. Dr. B. N. Ghosh, M.B.E., F.R.F.P. & S. (Glas.), L.M. (Dub.), F.S.M.F. (Bengal), F.R.S. (Edin.), Professor, Carmichael Medical College, Calcutta. 3. Lt. Col. G. R. McRobert, M.D., CH.B., D.T.M. & H., I.M.S., Government General Hospital, Madras. 4. Dr. W. R. Aykroyd, M.D., Director, Nutrition Research Laboratories, Coonoor. 5. Sir Hari Shanker Paul, C/o. Messrs. B. K. Paul and Company Ltd., Calcutta. 6. E. B. Fairbrass, Esquire, M.P.S., General Manager, Messrs. Kemp and Company, Bombay. 7. Dr. B. Mukerjee, D.SC., M.D., F.A.Ph.S., Director, Biochemical Standardisation Laboratories, Calcutta.

INDIAN CHEMICAL MANUFACTURERS ASSOCIATION

The Committee of the Indian Chemical Manufacturers Association met Lt. Gen. Sir Gordon Jolly, Director General, I.M.S., on 18-9-42 at the office of the Association, Mr. J. N. Lahiri presiding. The subjects discussed at the meeting included: (1)

Government undertaking research work and thereafter manufacture at Medical Stores Depots for the Drugs and Chemicals that are already being produced in the country. (3) Necessity of early enforcement of the Drugs Act, 1941. (3) Supply of quinine. (4) Imports of essential basic materials required by the Chemical & Pharmaceutical Industry, by the Government.

Lt. Gen. Jolly gave sympathetic hearing to all these matters and he assured that the Government were taking steps regarding supply of quinine having regard to the stock available with them. As regards essential basic materials, Lt. General Jolly stated that the Government were preparing a list of the essential chemicals and drugs that were not produced in India and would have to be imported from the U.K. or the United States of America. He also referred to the question of position about drugs and medicine supply in the country. In this connection difficulties of transport for medicines and essential chemicals were referred to. Lt. Gen. Jolly assured that he fully realised the importance of supply of drugs and medicines to civil populations also.

ORGANISATION OF MEDICAL RELIEF IN CHINA

Major-General Kho S. Lim, M.D., D.SC., F.R.S.E., etc. writes:

China was unprepared in every way for war. Barely 50 divisions were equipped to take the field. Only 6,000 qualified doctors and about the same number of nurses were available. China had no standing Army Medical Corps and barely 20 army hospitals. New medical organizations were recruited and established in great haste. None were allowed any time for training and few were adequately equipped.

During the first few months of the war, it was still possible to utilize existing hospitals in and around Shanghai and Nanking; but after December, 1937, the war front had spread to distant places and extended from the Northwest desert to the South China seas. Not only were hospitals lost but many well trained medical volunteers were left behind in the large cities.

The greater part of 1938, saw the Chinese army learning to fight without adequate air and land equipment. After the fall of Hankow, the strategy of defence in depth began to take effective shape. Broad bands of territory behind the lines averaging 100-150 kilometers were rendered roadless and the enemy allowed to penetrate until he began to suffer from his inability to bring in heavy artillery and mechanized equipment; then counterattacks were staged with singular success. The effect of the road-less areas was to greatly increase the difficulty of transport for rations, ordinance and medical evacuation.

Fortunately, the people were organized and returned to or remained in the roadless areas—growing foodstuffs and helping to carry supplies and casualties. They also served as the eyes and ears of the army in the absence of reconnoitering planes. Medical personnel attached to divisions had to organize hospitals on the roadless areas and gradually developed a medical service at the front which greatly reduced the need for evacuating casualties to the rear.

The lack of standard supplies at the beginning of the war was slowly made good, and the number of items reduced to the barest minimum and so packed that all items could be carried by human bearers (30 lbs. per package, 60 lbs. per bearer).

To improve the technical knowledge of the personnel, training schools were organized and nuclei of personnel from every medical formation were sent in rotation to the schools to get practical training in every aspect of the medical service—(medicine, surgery, preventive medicine, sanitation, nursing, supply service, administration, etc.). The course lasted 3 months.

With the gradual growth of the army from 50 to 300 divisions, the need for medical personnel was met through this training system. One training school was developed in each 'War area' and the principle upon which the training plan was developed was based on the assumption that eventually most of the personnel (after the war) could be utilised in the civil medical services. Consequently there was a close correlation between the military medical system of training and that given by the civil health authorities.

Little or no distinction was made between the soldiers and civilians in the front war areas, the latter being cared for both preventively and curatively by the medical units of the army. Women and children were naturally looked after, even deliveries were undertaken by army doctors and nurses.

The civil health services continued to expand so that by the third year of war, every province had its own State service. The service developed is by no means adequate, but progress continues and that is the main thing.

Most of the medical schools were moved to the interior, often with great loss of equipment and teaching personnel By grouping schools together, education has continued, and although the standard has undoubtedly been lowered, every attempt is being made to improve and build the schools up.

Lack of apparatus and especially books and journals are a serious handicap, but even this is being slowly remedied with the help of our friends in America and Britain.

The educative effect of the war on the people has been very great and this includes health education.

In conclusion, I would stress that China has been able to continue her struggle largely because the army and the people are struggling together, because they have been able to make sacrifices "to take it" as the Americans say, without feeling that each loss is a defeat—land has been given up, property destroyed, lives lost, *without counting the cost.* The spirit of the country has kept it going—and will continue to keep fighting until victory is achieved. So with medicine and its workers—we struggle on with the hope that only through struggling can we hope to build up an effective and adequate medical science for the nation and the people.—*Calcutta Municipal Gazette.*

EPILEPTICS IN AIR RAIDS

During the last few months there have been opportunities to observe the effect of unpleasant emotion on a group of about 250 epileptic children and 200 adults. The group comprises people of normal or retarded intelligence but not of low-grade mental defect. There were days last summer of considerable air activity with fighting directly overhead and planes brought down in the immediate neighbourhood. There was no general increase of attacks on days or nights of air activity, nor has any evidence been found of increased fits in individuals. At least 95% of our patients have to all appearances been unperturbed, and the resultant mental upset in the remainder has not been

striking. Are they heroes or stoics Probably the latter. It may be suggested that many of them have increased resistance to painful mental impressions, as they undoubtedly have to painful physical impression, a resistance that is not altogether consistent with the hypersensitiveness which is claimed as a cardinal feature of the epileptic temperament. A further factor may be found in medicine. Most of our patients are having anticonvulsant drugs in moderate doses, rarely exceeding bromide, gr. 30, or phenobarbital, gr. 2 in the 24 hours, and these have no doubt helped to discourage extra fits or mental upset. It need scarcely be said, perhaps, that the staff has had impressed on them the importance of appearing unconcerned in the face of danger, for our patients, with their immature outlook on life, will be more prone than other people to take their cue from those in authority. Moreover, it must be said that although the noises, alarms and excursions without seemed sometimes to be very close at hand, so far we have not experienced (apart from a few broken windows and damaged tiles) any actual damage to person or property. Perhaps events so far have kept outside the circumference of the epileptic's well-known egocentricity. Bring them a little nearer home, and the results may be different.

So far as it goes, however, our experience has shown that acute emotional stress is without effect on the incidence of fits in people suffering from epilepsy, and gives rise to surprisingly little mental upset.—*Lancet.*

PREVENTION ON BED-BUG INFESTATION IN AIR-RAID SHELTERS

The following insecticide formulæ have been recommended by the Medical Reasearch Council of Great Britain for use in air-raid shelters:

1. Pyrethrins in Kerosene—the preparation should have a guaranteed content of 0·6% to 0·8% of the pyrethrins. Alternatively, a weaker pyrethrin solution made equally toxic for bugs by the use of an adjuvant and harmless to human beings may be accepted.

2. Thiocyanates—(*a*) Lethane in kerosene should have a guaranteed content of 6 per cent "lethane 384" and (*b*) Lauryl thiocyanate in kerosene requires a guaranteed content of 3% of lauryl thiocyanate.

3. Heavy Coal-tar Naphtha with Cresylic Acid—Cresylic acid (5 per cent) to be dissolved in heavy coal-tar naphtha should comply with the following specifications: (*a*) Specific gravity at 60°F; not less than 0·835 or greater than 0·910, (*b*) Distillation range (S.T.P.T.C. apparatus) not more than 10% at 160°C and not less than 99% at 190°C, (*c*) Flash point (Abel) not less than 100°F, and (*d*) Tar bases not exceeding 0·25%.

As regards the methods of application, power sprayers in large shelters and hand sprayers of the "flit" or similar type have been advocated. A brush might be used for cracks and other readily accessible places which might harbour bed-bugs. Much may be done to prevent infestations by the obliteration of places likely to harbour bed-bugs and for the latter purpose cement-washing, distempering and painting may be employed. Where a high standard of cleanliness is maintained in shelters, the risk of serious infestation by bed-bugs is greatly lessened.

(*Continued on page 70*)

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors—EDITOR.

L.M.P. BOMBAY DIPLOMA—A REJOINDER

THE EDITOR, *Journal of the I. M. A.*, Calcutta.

Sir,

In the October issue of your esteemed Journal, Dr. Chamanlal Mehta justifies the four and half years course for the Licentiates as instituted by the College of Physicians and Surgeons, Bombay, by saying that it is in accordance with the views of the medical profession and the Delhi Educational Conference of 1938. The Indian Medical Association represents the profession and Dr. Mehta one of its executive officers should not have so easily forgotten Resolution No. 13 of the 15th I.M.A. Conference held at Meerut which reads "This Conference is of opinion that in view of the unanimous decision of the Delhi Conference on Medical Education in India held on November 7, 1938, this Conference requests the Provincial Governments—

(*i*) To take early steps to establish a uniform minimum standard of medical education in their respective provinces the standard being that of University Degree, and

(*ii*) To abolish all examining bodies, other than the Universities, which may be granting medical diplomas and licences."

These examining bodies *mean and include* the College of Physicians and Surgeons of Bombay of which he is a member. The resolution demands, in unequivocal terms, the establishment of an University Standard, that is *a five years' course* after I.Sc. That is exactly what the "Licentiates Association and its branches throughout the country have cried themselves hoarse day after day" and that is what the president of the Bombay branch has repeatedly dinned into the ears of the College worthies. He dared not do otherwise; that was the mandate of his Association. But if the college prefers to be deaf to these pleadings, if the I.M.A. members therein, especially the Mehtas-trio, Dr. Jivraj, Sir Mangaldas and the writer, flout the resolution of the parent organisation above mentioned, and if they support the mischievous move of the College to have a course of 4½ years after I.Sc. for the Licentiates, they have to thank themselves for the uproar against such an action which perpetuates the compartmentalism and caste system in the profession. The Licentiates refuse to be bullied by these Mehta-brand mathematical prodigies, into believing that 4½=5. The Licentiate class has preferred self-immolation, not for the sake of vested interests, but for unity in the medical profession, not for the perpetuation of different grades, but for one uniform standard of medical education in the country. No half-hearted measures, *not a day less* than the fixed minimum of 5 years, will satisfy them. Let none be under the delusion that the Licentiates will accept anything like a step by step reform. Medical India, like national India, has asked for complete medical swaraj and it shall have it.

Even the Delhi Conference on Medical Education which is made much of by the worthy writer says that until the requirements of the I.M.C. could be fully met with, improvements be effected in (1) the preliminary educational qualifications, (2) pre-clinical scientific subjects, and (3) clinical subjects. The College, therefore, should have at least made the pre-clinical subjects of the junior L.C.P.S. equivalent to that

of the junior M.B.B.S. in the revised curriculum. Even Dr. Mehta feels that this has not been done, but he has to shield his Institution and brushes the argument aside as a matter of 'details and adjustment'! Hence the College has neither acted up to the I.M.A. resolution nor the Delhi proposition, but according to its own whimsical determination and eccentric decision.

Dr. Mehta recounts the tragic story of the long drawn out tussle between the College and the Government. Quite right. But if the Government were at fault in refusing to bring the Medical Education to the required minimum of 5 years, there was no justification for the College to have committed a bigger blunder. Why raise the course at all if it was not to be the requisite minimum and thus make the students suffer? And that too when the Government have decided to abolish the class? Was "just a little difference" kept in the "interest of the students or the profession"?

The Government as late as January 1942, assured the Bombay Licentiates that the Poona and Ahmedabad schools would be converted to medical colleges before long. The Licentiates and the profession will leave no stone unturned to see that this conversion becomes an accomplished fact. But during this interim period, the Licentiates did not want to have an increased course of studies which did not give them an iota of increased status or prospects, one which did not come up to the demanded standard. Therefore, it is that they welcome the move of the Government in instituting the L.M P. diploma to combat the tyrannising attitude of the College. This diploma is *exactly the same* as the L.C.P.S., but in a different terminology. The students who were uptil now obtaining L.C.P.S. from the College will now get L.M.P. from the Government Faculty. The status, position and prospects for higher studies etc., will remain the same for both the diploma holders. To characterise the L.M.P. diploma as inferior to that of the College is nothing but an exhibition of helplessness and impotent rage.

The M.C.P.S. has been brought again to the forefront to lure the students. The thoughtless revision of the L.C.P.S. curriculum has thrown the College into an abysmal confusion from which it found itself difficult to extricate. A Licentiate with 3½ years' course could obtain M.B.B.S. after 2½ years but required three years for M.C.P.S., an inferior qualification granted by the College. It is only after this anomaly was pointed out that the College revised the M.C.P.S. curriculum, but that was for the 4½ years' course Licentiates. What about those with 3½ years' course? The University allows the M.C.P.S.s to appear for M.B.B.S. but for this the 1st, 2nd and 3rd M.B.B.S. examinations are to be gone through. And if the "M.C.P.S. is recognised by I.M.C. of India" (?), why on earth should one go in for M.B.B.S.?

Regarding the chances for the L.M.P.s or L.C.P.S.s for going for higher studies, it is not known to many that out of about a dozen eligible Licentiates who applied for admissions to the M.B.B.S. course last year, three were admitted by the Government-owned Grant Medical College, but none by Dr. Jivraj Mehta of our beloved National Institution!

Let the Profession, therefore, decide whether the stand taken by the Licentiates has been in the best interest of all concerned, or not. I am etc.,

U. B. NARAYANRAO,
President, Bombay Branch,
All-India Medical Licentiates Association

Bombay
9-10-42.

OBITUARY

DR. N. RAMUNNI

Death occurred of Dr. N. Ramunni on 1-7-42.

Dr. Ramunni was born of a respectable Thiya family in Malabar in Kannookkara, Cannanore, on the 8th December, 1888. He had his early education in Nelliyat Elementary School of Kannookkara and the Municipal High School, Cannanore, having passed his Matriculation from the Mission High School in Tellichery. He joined the Medical School at Rayapuram in 1908 as a military stipendiary student. On completion he was first appointed as a Sub-Assistant Surgeon in the Civil and Military Station, Bangalore. He subsequently changed over to the M.S.M. Ry. department and served at the Bellary Railway station for 5 years. He later worked under Messrs. T. Subba Rao & Co., and Messrs Gowna Bros., Bellary, as a consulting physician and attending doctor respectively. In the year 1924 he started independent practice and within a short time became very popular amongst the public and enjoyed a lucrative practice which he maintained till the last.

Dr. Ramunni was Vice-President of the Bellary Branch of the Indian Medical Association. He was one of the prominent promoters of Messrs. The Bellary Medical and Surgical Stores Ltd. He was the seniormost Free Mason of the Lodge of the Good Will, Bellary, and attained high rank in the Order. He was an Officer of the District Grand Lodge, Madras.

A man of charitable disposition, Dr. Ramunni was steady in his ways, kind and considerate and of sound judgment. He was amusing and witty as also humble and amiable. His hospitality to friends was always characterised by good cheer and regard and his social disposition exemplary.

He leaves behind him his wife, two sons, two brothers and three sisters and a host of friends to bemoan his loss.

At a meeting of the Bellary Branch of the I.M.A., held under the Presidentship of Dr. Mrs. J. K. Mackinnon, L.M.P., the following resolution was passed, all members standing:

"The Bellary Branch of the Indian Medical Association places on record its deepest sense of sorrow at the sad and untimely demise of Dr. N. Ramunni, a member and former Vice-President of this Branch, and offers its sincerest condolences to the members of the bereaved family."

(Continued from page 69)

The precautions to be taken during use of the above preparation are as follows: (1) They should be only used when a shelter is empty, and an interval of at least two hours should be allowed to elapse before the shelter is again occupied. (2) To avoid any possible risks of fire the use of naked lights and smoking should be strictly prohibited while handling and spraying these insecticides. (3) Owing to the interaction of hypochlorites and pyrethrine, or even traces of cresylic acid, air disinfection of shelters cannot be carried out concurrently when either formula 1 or 3 is used. Several days should elapse between the two forms of treatment. (4) Owing to the possible solvent action of heavy naphtha, care should be taken when using formula 3 to prevent its coming into contact with rubber.—*Science and Culture.*